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Original Articles

NEUROLABYRINTHITIS OF FOCAL INFECTION ORIGIN IN A CASE WITH A PLUS-FOUR WASSERMANN

GEORGE W. MACKENZIE, M. D.
PHILADELPHIA, PA

The clinical picture of Neurolabyrinthitis of Focal Infection Origin and that of syphilis resemble each other sufficiently to warrant the closest kind of study to differentiate them. In looking for the etiologic factor in neurolabyrinthitis we cannot accept as conclusive the finding of a positive or a negative Wassermann alone; for cases of neurolabyrinthitis syphilitica exist, especially of the latent form, with a negative Wassermann. On the other hand, neurolabyrinthitis from a focal infection can exist in the presence of a plus-four Wassermann without the syphilitic virus contributing any appreciable influence; witness the case to be cited. The best proof of precision in the consideration of cause and effect is the promptness and permanency of the improvement or cure* of a disease that follows the removal of the causative factor in question. In no case is this more true than in neuralabyrinthitis.

Concerning the subject of neurolabyrinthitis, I have already written quite freely; notwithstanding, there still remains much to be said. The most gratifying results thus far obtained by him have been in cases of neurolabyrinthitis of focal infection origin referred quite frequently, by other otologists because of vertigo and nystagmus that prompted the suspicion of some more serious intracranial condition. Such cases are by no means rare. The one to be reported is of that kind.

The case, S.W., male, age 52 years, physician, was first seen by the writer February 20, 1926.

History—Between the age of 16 and 17 years the patient went through an attack of pneumonia with empyema. In the year 1918 he had an attack of "Flu." He has suffered no other illnesses excepting slight colds. About six weeks ago he had laryngitis, with infection in the nose and throat, which cleared up under treatment in a few days. His present illness began about three weeks ago with dizziness. He did not think it very important at the time and continued working very hard, as he had been doing for two weeks before. The dizziness not only continued but became more severe. After four days he began to ease up on his work. One evening there developed severe headaches which lasted for about a half hour. His partner tested the blood pressure and found it 100 systolic. The diastolic pressure was not recalled. The patient and his partner decided that the illness was due to overwork. However, he continued to work, but not so hard, for about three more days. The dizziness increased, but was less evident when he was quiet and sitting still. After a few more days he found that moving the head to the left side increased the dizziness very much. He then called in an ophthalmologist, who discovered that the eyes were normal with the exception of a "rotary nystagmus to the right." The optic discs were observed to be normal as well as the blood-vessels in the fundi. His physician examined him later and "found intense congestion of the mucosa of the nose and the Eustachian tube blocked on the left side." His diagnosis was "acute labyrinthitis." Following this the patient claims to have had a specialist in internal medicine and a neurologist to examine him. At that time it was claimed the Romberg was normal. There was slight incoordination in the muscles of the legs. No headache and no pain of any kind since the beginning of his present illness except that already noted; diagnosis of acute labyrinthitis. The treatment of the nose was continued, and after a week the left Eustachian tube was catheterized. The feeling in the ear today, February 20th, 1926, is the same as it has been for the last two weeks. The ear feels as though it was "blocked." The hearing has been variable, at times "less than 50 per cent, and at other times considerably better." It has not been normal at any time. His voice sounds to him as though it was far away. The nystagmus has gradually improved. On Monday last (five days ago) another neurologist made an examination and diagnosed a "thrombus in the cerebellum," and spoke of having seen "one case in Boston similar to his with a negative Wassermann." The Wasserman was then taken and found to be plus four. Before this the unanimous opinion was that of acute labyrinthitis due probably to infection of the

* The word "cure" cannot be made to apply to all cases. The reason is evident when we consider that long-lasting toxemias lead to chronic plastic inflammation with its concomitant metaplasia of the higher developed sense epithelium. Therefore, the more tardy we are in removing the source of the toxemia, the more fixed the pathologic changes have become when the results take on more the form of "improvement" than of complete "cure." The complete cures occur in those cases only where the toxemia has not produced changes beyond those of congestion or mildly acute serious inflammation.

nose and throat brought on by overwork. It was suggested that a few weeks' vacation in Florida would fix him up, and transportation to and accommodations in Florida were arranged. Antisyphilitic treatment was started on Wednesday following the examination by the Boston neurologist. About this same time it was decided to leave the whole matter, including the labyrinthine tests, in the hands of the writer.**

At the beginning of his present illness his head was X-rayed, but nothing abnormal was found. Last May (nine months ago) he was sick for two weeks with what was pronounced cholecystitis, but which the patient now believes was some syphilitic manifestation. For the past two years he has been a "teetotaler." Before that time he went through a two months' siege of drinking, the blame for which he put onto some heavy financial losses. Prior to that time he was but a very moderate drinker.

The teeth had been X-rayed often (every six months). The last time was at the beginning of his present illness. He is aware of the presence of several "dead" teeth, but denies having any pyorrhoea. The dentist advised him to keep the teeth for a while. Temperature taken on this first visit was 99.2°F.

The functional hearing test findings elicited at this first visit are as follows:

Right Ear		Left Ear
Short 5″	Weber	
Short 7″	Schwabach	Short 10″
+ 40″	Rinne	+ 45″
Short 13″	Air	Short 18″
Short 40″	C_1	Short 60″
Short 5″	C_4	Short 8″

Otoscopic examination of the right ear reveals a slight amount of cerumen, requiring removal before a satisfactory inspection of the deeper structures could be made. The drum membrane is intact, brilliant, of normal translucency, allowing the long process of the incus to be seen. There is no pathologic retraction; the mobility of the membrane is normal with the Siegel instrument. With Politzer inflation the membrane comes out over a large area without overlapping the Stria malleolaris, and returns promptly to its primary position.

Otoscopic examination of the left ear presents no cerumen or other obstruction in the canal to interfere with the observation of the drum membrane. It is intact, brilliant and normally translucent, allowing the long process of the incus to be seen. The mobility of the membrane is normal with the Siegel instrument. With Politzer inflation the membrane comes out over a large area without overlapping the Stria, and returns promptly to its position.

Examination of the nose shows the mucous membrane to be quite red on both sides. There is a pronounced deflection of the nasal septum to the right side, with a large spine along the suture line on the same side. After shrinking the mucous membrane with cocaine, the left middle turbinate becomes visible. There is a free space between the left middle turbinate and the lateral wall and between it and the septum. The right middle turbinate also becomes visible after shrinking. It appears to be undersized because of the septal deflection to that side; likewise, the right inferior turbinate is undersized. There is a compensatory hypertrophy of the left inferior turbinate, together with a slight hyperplasia of the mucous membrane along its inferior margin and posterior end. There is no gross evidence of accessory sinus disease by anterior rhinoscopic examination.

Examination of the throat reveals a small papilloma at the base of the uvula on the left side. Both tonsils are submerged, and from the crypts cheesy deposits can be expressed with the pillar retractor. There is a slight secondary catarrhal pharyngitis present.

Examination of the teeth shows very evident pyorrhoetic resorption. The upper right first molar is carious, and there are several other very questionable teeth which warrant a careful X-ray examination.

Examination for spontaneous nystagmus: When the patient looks to the extreme right side there is a fairly pronounced nystagmus to the right. When he looks to the extreme left side there is a fairly pronounced nystagmus to the left. However, there is this difference: The nystagmus to the right side is preeminently horizontal in character; whereas the nystagmus to the left side is more rotary, with the same angle leviation of the eyes. Upon looking straight ahead the presence of nystagmus to the right side is doubtful.

Galvanic Test:

Right Ear	Left Ear
Kathode 4½ Ma.	Kathode 9 Ma.
Anode 10 Ma.	Anode 10 Ma.

Turning test, with the head erect: After ten turns to the left side there follows a horizontal nystagmus to the right, lasting for 12 seconds. After ten turns to the right side there follows a horizontal nystagmus to the left, lasting for 9 seconds.

With the head inclined 90 degrees forward: After ten turns to the left side there follows a rotary nystagmus to the right, lasting for 11 seconds. After 10 turns to the right side there follows a rotary nystagmus to the left, lasting for 5 seconds.

The patient was then sent to Dr. B. M. Wagenseller for a differential blood count and urinalysis, and to Dr. J. W. Post for an X-ray examination of the teeth. He was put on mercurial injections, and told to report in two days.

The blood findings, under date of February 20, 1926, were as follows: Hemaglobin 90 per cent; red blood cells 5,180,000; white blood cells 12,000; polynuclear 53 per cent; small lymphocytes 39 per cent; large lymphocytes 5 per cent; eosinophiles 3 per cent.

Urinalysis report by Dr. Wagenseller February 22, 1926, reads: Color yellow; reaction acid; spec. grav. 1031; albumen negative; sugar negative; indican normal; epithelia present; oxalates present; urates present.

The X-ray examination of the teeth revealed the following findings: The upper left third molar, upper left first molar, upper left second bicuspid, upper right second bicuspid and the upper right second molar are all pulpless teeth, showing evidence of chronic periapical disease. The lower right remaining molar is a pulpless tooth showing no evidence of canal filling in the distal root. This tooth should be looked on with marked suspicion, in view of all the other changes. The distal aspect of the root of the tooth is denuded of the alveolar process for about two-thirds of its length. There is a large area of caries beneath the filling at the neck of the tooth. There is also an area of caries on the mesial aspect. The entire alveolar process shows marked pyorrhoetic changes about the lower central and lateral incisor region.

February 22, 1926: The patient reports for the second visit. He thinks his hearing has grown worse since the last visit. He also complains of more noises on both sides, but worse on the left. He complains, too, of a "stuffed up feeling" in the left ear.

The functional hearing tests were repeated on this

** The very complete history up to this point is the result of careful observation on the part of the patient. He was asked to take his time and write out the history fully. It was copied almost verbatim. The remaining history was elicited by questioning the patient.

visit, first by myself and then by Dr. A. V. Mackenzie. The average findings for the tests are as follows:

Right Ear		Left Ear
Short 13″	Weber	
Short 7″	Schwabach	Short 18″
+ 39″	Rinne	+ 18″
Short 8″	Air	Short 40″
Short 40″	C_1	Short 90″
Short 5″	C_4	Short 8″

Examination for spontaneous nystagmus: Horizontal nystagmus to the right when the patient looks to the extreme right. Mixed rotary, horizontal nystagmus to the left when he looks to the extreme left. The nystagmus to the right appears to be a shade more pronounced than that to the left. There is a doubtful nystagmus to the right when the patient looks straight ahead.

Galvanic Test repeated at this visit gave the following results:

Right Ear	Left Ear
Kathode 5 Ma.	Kathode 9 Ma. No reaction
Anode 9 Ma.	Anode 9 Ma. No reaction

He complains of his mouth being quite sore, due no doubt to the combined influence of extractions and intensive mercurial treatment.

The report on the bacteriological examination made by Dr. Wagenseller under date of February 27, 1926, reads as follows: Four teeth were cultured—upper right and left bicuspids; upper right and left molars. Growth was obtained from three, upper right molar giving nothing. Growth in all tubes was the same, as follows: Staphylococcus albus predominates; gram positive bacilli present; gram negative bacilli present.

On March 1, 1926, the patient reports that his hearing is slightly better, but is still "thick." The mouth feels quite sore, for which he was referred to Dr. Lloyd Strohm (Syphilologist) of Philadelphia.

March 2, 1926: Dr. Strohm reported that he had discontinued the mercurial inunctions and instituted treatment with bismuth injections. From this time on, Dr. Strohm took charge of the treatment of this feature of the case. The patient reports that the vertigo is a little better today. He says that he can "walk better today than any day yet." The stopped up feeling in the left ear still continues. The lower right molar which the patient looked upon with suspicion has not been extracted.

March 12, 1926: The patient reports that after each extraction there is a temporary aggravation of his vertigo. The patient was so emphatic about this statement that it appears underscored in the original records. Owing to the extensive pyorrhoea, in addition to the other pathologic changes noted by Dr. Post, it was deemed best to make a thorough clean-up of both upper and lower alveolar processes. Furthermore, it was considered advisable not to remove more than three teeth at one sitting, and then watch carefully for excessive reaction for a day or two following, before proceeding with further extractions. The worst appearing offenders were left for the last. The order of the extractions and after treatment, taken from the records of the Exodontist, Dr. Cos Leffmans, is as follows:

February 23, 1926: Extraction of three teeth; upper left first bicuspid, upper left first molar and upper left third molar. Apical abscesses were curetted thoroughly and cultures taken.

February 24, 1926: Two teeth were extracted; upper right first bicuspid and upper right second molar; thoroughly curetted sockets.

From February 25, 1926, until March 4, 1926, the sockets of the extracted teeth were syringed daily. On the latter date one tooth, the lower right third molar, was extracted and pyorrhoetic abscess drained and packed with gauze.

March 5, 1926: Treatment of gingiva with chlorodone.

Until March 10, 1926: Conservative treatment; besides three extractions with thorough curettment—the lower left lateral incisor, canine and first bicuspid.

March 12, 1926: Three extractions, with thorough curettment—the lower right cuspid and first and second bicuspids.

March 17, 1926: Two extractions, with curettment —lower left second bicuspid and first molar.

March 18, 1926: Four extractions*** were made, with thorough curettment. The differential blood count was made one hour before, again on the following day (March 19), and again on March 20, reports of which appear elsewhere.

March 26, 1926: Extraction of two supernumerary teeth. After this date there followed daily treatment of the sockets.

April 9, 1926: Removal of sharp corner of process from the region of the upper left cuspid.

The blood count made prior to the four extractions of March 18 netted the following findings: Hemaglobin 98 per cent; red blood cells 4,680,000; white blood cells 13,200; polynuclear 54 per cent; small lymphocytes 35 per cent; large lymphocytes 6 per cent; transitional 1 per cent; eosinophiles 4 per cent.

The blood count made the day after was as follows: Hemaglobin 86 per cent; red blood cells 4,600,000; white blood cells 10,400; polynuclear 55 per cent; small lymphocytes 29 per cent; large lymphocytes 7 per cent; transitional 1 per cent; eosinophiles 5 per cent; basophiles 3 per cent.

Two days after (March 20, 1926) the findings were: Hemaglobin 90 per cent; red blood cells 4,440,000; white blood cells 8,000; polynuclear cells 55 per cent; small lymphocytes 23 per cent; large lymphocytes 15 per cent; transitional 2 per cent; cosinophiles 5 per cent.

March 20, 1926: The patient reported that he felt generally much better. There was a very questionable spontaneous nystagmus to the right side, with no vertigo. He was still under treatment with bismuth, and also under the care of Dr. Leefmans for the after-treatment of his alveolar processes following the extractions, until April 9, 1926, when he went home, to report again in a few weeks.

On April 8, 1926, the blood Wassermann test made by Dr. Wagenseller was found to be plus four as on former occasions.

April 9, 1926, the urinalysis was: Color, light yellow; reaction acid; sp. grav. 1025; albumen, faint trace; sugar, none; indican, marked; aceton, none; diacetic acid, none; epithelia, few; hyaline casts, considerable; granular, numerous; oxalates and urates present.

Under date of April 17, 1926, the patient sent a report of his condition, abstracts from which read as follows: "I am feeling very much better.

The vertigo has continually improved. I might say that taking it week by week there has been a decided improvement in the vertigo each week for the past three weeks. An examination of the urine made April 14th showed no albumen, no hyaline casts, a few

*** On this particular day our rule of "not extracting more than three teeth" at one sitting was broken, the writer having been present and cooperating. It was these particular teeth and sockets that the writer felt were most responsible for the patient's ailment and which required the most careful study, surgically and bacteriologically, and controlled further by three differential blood counts.

granular casts (3 or 4 in the whole field) and some cellular debris. An examination made today shows no change, with the exception that there are a few more granular casts."

Under date of May 6, 1926, another letter was received from the patient, abstracts from which read as follows: "I have followed the regulations carefully" (this referred particularly to the treatment of his syphilitic condition, which was now under the supervision of Dr. John B. Ludy of Philadelphia, who was substituting for Dr. Strohm, "am feeling much better and have gained three pounds since leaving Philadelphia, now weighing 184 pounds, which is 14 pounds heavier than I weighed all last year. Urinalysis made yesterday showed practically no casts, no albumen and no debris."

June 9, 1926: The patient reports in Philadelphia that he is weighing more than he ever did, 186 pounds. He feels no vertigo, except rarely upon turning in bed from left to right. He feels slightly fatigued if he works too hard. He believes his hearing is good. The mouth has all healed up. Urinalysis is negative to albumen, casts and other pathologic findings. The functional hearing tests at this time are:

Right Ear		Left Ear
	Weber	
Short 5″	Schwabach	Short 7″
+ 45″	Rinne	+ 47″
Normal	Air	Normal to questionably shortened
Normal	C^1	Normal
Normal	C^4	Normal

Spontaneous nystagmus: Mixed rotary horizontal nystagmus to the right when looking to the extreme right. Mixed rotary horizontal nystagmus to the left when looking to the extreme left (physiologic). No nystagmus when looking straight ahead.

Galvanic test:

Right Ear	Left Ear	
Kathode 6 Ma.	Kathode 9 Ma.	No reaction
Anode 7 Ma.	Anode 7 Ma.	(?)

Turning test, with head erect:

After 10 turns to the left there follows a horizontal nystagmus to the right lasting for 10 seconds.

After 10 turns to the right there follows a horizontal nystagmus to the left lasting for 6 seconds.

Turning test, with head inclined forward 90 degrees:

After 10 turns to the left there follows a rotary nystagmus to the right lasting for 9 seconds.

After 10 turns to the right there follows a rotary nystagmus to the left lasting for 6 seconds.

Caloric test: After syringing the left ear with 2,000 c.c. of water at 60°F. over a period of five minutes, there follows no reaction in the form of nystagmus or otherwise with the head in an upright position or inclined in any direction.

Romberg is negative. The gait forward and backward, with eyes closed, is not as good as that of the average normal individual; in other words, it is more uncertain, and the tendency to stagger is greater in his case.

September 2, 1926: The patient reports that he feels better than he has for years. He hears well and has no vertigo. He weighs 187 pounds. and is thinking of taking exercise to reduce. The blood Wassermann is still plus four in spite of treatment.

Functional hearing tests:

	Weber (?)	
Normal	Schwabach	Normal
+40	Rinne	+40
Normal	Air	Normal
Normal	C^1	Normal
Normal	C^4	Normal

Spontaneous nystagmus: When looking to the extreme right there is nystagmus to the right. When looking to the extreme left there is nystagmus to the left, but to neither side more pronounced than the other; hence physiologic. There is no nystagmus when he looks straight ahead.

Galvanic test:

Right Ear	Left Ear
Kathode 6 Ma.	Kathode 7 Ma.
Anode 7 Ma.	Anode 6 Ma.

Turning test: After 10 turns to the left, with head erect, there follows a horizontal nystagmus to the right. lasting for 12 seconds. After 10 turns to the right, with head erect, there follows a horizontal nystagmus to the left, lasting for 11 seconds.

With the head inclined forward 90 degrees:

After 10 turns to the left there follows a rotary nystagmus to the right, lasting for 11 seconds. After 10 turns to the right there follows a rotary nystagmus to the left, lasting for 8 seconds.

Caloric test: After syringing the left ear with 2700 c.c. of water at 55 degrees, lasting for a period of 7 minutes, no nystagmus occurred in any position of the head, nor did the patient experience any vertigo.

SUMMARY

1. The diagnosis of neurolabyrinthitis is established on the strength of the history and findings, particularly the latter. The impairment of hearing was distinctly of the perceptive type: He claims to have heard his own voice as though it was far away, and when he spoke his voice was rather loud, just the contrary to that found in the conductive type of deafness. Furthermore the Weber was referred to the better-hearing ear; the bone conduction was shortened; there was diminution of hearing for low, middle and high tones by air conduction.

The vestibular nerve was involved along with the cochlear, as evidenced by the history of vertigo, the diminution of after-turning nystagmus to both sides, more especially to the affected (left) side, the negative caloric reaction, and the typical galvanic findings of vestibular nerve involvement, to wit: Absence of reaction on the affected (left) side, with preservation of reaction on the other (right) side.

2. In this case there were two etiologic factors present, either of which is capable of producing neurolabyrinthitis. They were, syphilis and focal infection. In the case of syphilis, the tendency of the affection is to be bilateral; whereas, in focal infection the tendency is toward unilateral involvement. A knowledge of these facts led the writer to suspect the neuro-

labyrinthitis in this case to be of focal infection origin rather than syphilitic; however, it did not prompt him to ignore the syphilis or to relax its treatment.

The characteristic blood findings clinched the diagnosis of focal infection. It has been my experience, in cases of focal infection, to find the total white blood cell count ranging from 10,500 to 16,000 with a small lymphocyte count somewhere between 30 and 38 per cent. Even more conclusive were the blood findings on three consecutive days (March 18, 19 and 20); the first count was made just before extraction of the last four infected teeth; the second count was made the day after, and the third count the second day after the extractions. There was nothing else done at this same time to influence the blood findings, nor did the character of the Wassermann change in any way.

The improvement in the blood findings marked a definite change for the better: (a) general sense of well being, (b) increase in body weight, cessation of vertigo, and (d) rapid improvement in hearing.

Concerning the [illegible]tibular nerve which was completely out of function at the height of his trouble, as indicated by its negative conductivity (reactibility) to galvanism, it improved sufficiently, after a few months, to be again responsive, but not so the vestibular labyrinth, which failed to react to cold water (caloric test).

The lack of improvement in his Wassermann, though unfortunate in one way, served a scientific purpose [illegible]allowed us an opportunity to study the comparative effects of syphilis and focal infection under the most favorable circumstances. Had the syphilis played the least etiologic role in the neurolabyrinthitis, such marked improvement in every respect could hardly have been expected without a concomitant improvement in the Wassermann.

There can be no doubt as to the eventual success in the treatment of the patient's syphilis, since he is in the hands of two syphilologists, who have collaborated in the treatment of this phase of the case.

The patient still has tonsils which appear more infected than the average case calling for removal. They are to be removed at an early date by a capable nose and throat specialist of his own city, for fear that sooner or later they may serve as a focus for a recurrence of his neurolabyrinthitis.

BLOOD TRANSFUSIONS, INDICATIONS AND METHODS*

ALFRED A. STRAUSS, M. D., F. A. C. S.

*(From the Surgical Services of the Michael Reese and Chicago Lying-in Hospitals, Chicago.)**

CHICAGO, ILL.

In the earlier years of surgical history blood transfusion was considered a heroic measure, employed only for two indications: profound anemia and severe hemorrhage. Even at present after so much has been written on it, one can go to many large institutions and much to one's surprise, see it used very rarely and then only for the two above indications.

But the transfusion of blood has a much wider field of application. It is just as important to the pediatrician and the medical man as it is to the surgeon.

Before detailing its manifold uses, let us consider its effects. In general, they are: rise in blood pressure, an increase of 1,000,000-2,000,000 red blood cells; increased leukocytes, hemoglobin and coagulability of the blood. But that is not all; the patient also gets the serum, loaded with immune bodies and nutritive substances. It is a definite heart muscle stimulant, as many of our internists will collaborate. In our opinion, not even digitalis can take the place of 200-300 cc. of blood in its tonifying effect upon the heart muscle. Our clinical experience does not support the theoretical objection that hypertension and a failing heart contra-indicate blood transfusion. We have not seen any acute dilatation of the heart even in cases of pneumonia.

Most surgeons use blood transfusion only as a last resort, when the patient is moribund. Such a test is patently unfair to this valuable remedy. In over sixteen years we have used it extensively in our pre and post-operative care, in connection with saline and glucose solutions. We always perform blood transfusion when there is the slightest indication for it and use it as a prophylactic against surgical risks. We have undertaken with success surgical procedures that would have appalled many a surgeon, surgical risks that were well nigh hopeless. We do not attribute this success to better operative technic or skill, but to good preoperative and post-operative care, the procedure par excellence of which is a blood transfusion. Surgical judgment, yes; good surgical technic, by all means; but do not hesitate to use this procedure that has converted many a questionable risk into absolutely safe ones.

Cases with secondary anemias following chronic ulcers of the stomach, duodenum, chronic ulcerative colitis, carcinoma of the

* Read at Annual Meeting, September 1926

stomach, of the duodenum, colon and rectum are usually poor surgical risks. They are submitted to the following pre-operative regime. Daily for three to four days, sometimes as long as six to eight days, they are given 500 cc. of 5 per cent glucose and 3000 cc. of saline. Then a blood transfusion is given to cap this preoperative preparation before the final plunge of operation. The contrast between a patient that has been prepared thus and one that has not is too striking to be ignored. The patient with this preparation returns to bed following the operation with a full pulse, usually less than 100, blood pressure ranging from 110 to 130, flushed face, red lips, warm extremities and free perspiration and without secondary shock; the one without such preparation returns cold and clammy, pale, with a rapid pulse, and gives the surgeon 24 to 72 anxious hours. The surgeon will then resort to these procedures which he should have carried out before the operation. The moral is obvious: it is much easier to use these prophylactic measures to prevent shock than to use them after shock has supervened.

A great deal of objection has been raised against too many transfusions at short intervals, but oftentimes in large patients the transfusion of the usual 600 cc. is not sufficient to make up the blood loss. In many cases of duodenal ulcer with profuse hemorrhage, we have given as many as two transfusions before and a third after the operation. In on instance, a man of gigantic proportions was admitted with profound duodenal bleeding. He was given two successive transfusions of 800 cc. and 600 cc. respectively by two different donors before the operation, a transfusion of 600 cc. after the operation and a fourth of 600 cc. twelve hours later. The result was excellent and no untoward effects were observed.

In bleeding duodenal ulcers our experience has been as follows: In young individuals who have bled a great deal, with a rapid pulse and marked anemia, a transfusion not only stops the bleeding but also brings them out of their critical condition. We have repeatedly observed after a transfusion, that the hemoglobin and red cells are markedly increased and the pulse after a few hours drops from 140 or over to 100 and remains there—evidences that the hemorrhage has stopped due presumably to the increased coagulability of the blood. Older individuals, however, owing to arteriosclerotic vessels, have a tendency to repeated hemorrhages after 24 to 48 hours after a transfusion. Undue delay in these cases sometimes lead to a fatal termination. We therefore believe it best to transfuse them just before the operation, operate on them by ligation of the bleeding vessel or excision of the ulcer, and tren transfuse following the operation if necessary; instead of transfusing and waiting as in younger patients.

In the preparation of jaundiced patients, blood transfusion not only increases their resistance, but also decreases the coagulation time from say 8 to 10 minutes to 2½ or 3 minutes. In cases where there is cholemic delirium, the transfused blood seems to have a detoxicating effect, as soon after the transfusion, the patients become rational. In gynecological and obstetrical hemorrhage, this is a weapon that has not been used to any large extent but when used will surely reduce the mortality rate. One readily runs one's mind over such conditions as ectopic pregnancy, postpartum hemorrhage, and hemorrhage from placenta previa, etc.

The effect of blood transfusion in child surgery is even more brilliant than in adult surgery. The child seems to respond more readily and the effects seem to be more lasting. This is exemplified in long standing cases of bleeding Meckel's diverticulosis, in long standing cases of pyloric stenosis, and in operative shock as in prolonged operations on the gastro-intestinal tract.

In hemorrhages from the new-born, especially into the gastro-intestina ltract, a pallid, apathetic, stuporous baby can be converted within a few minutes as if by magic into a pinkish, healthy looking baby by the mere introduction of 50-75 cc. of blood into the longitudinal sinus. One transfusion usually stops the hemorrhage and in only a few cases is a second tranfusion necessary. At the Chicago Lying-in Hospital, we have had a practically 100 per cent success with these cases. The coagulation time is definitely shortened and bleeding stops.

In the nutritional changes associated with diarrhea in infants, in decomposition or atrophy, I know of no greater remedial aid.

In severe pneumonias of childhood it is also being used with considerable success.

In the adult it is of special value in the various anemias in which splenectomy is indicated. In pernicious anemia it is of temporary benefit. Repeated small transfusions have saved many lives in the slow, mild chronic suppurative processes with secondary anemia. In cancer cases we have seen very good effects, and the theory of the carcinolytic power of the blood of young donors bears further investigation.

In pneumonias, it seems to have a detoxicating effect. In patients with temperature over 107, and delirious, the giving of 300 cc. of blood clears the sensorium to lapse again in 24 hours. A repetition of the transfusion induces a similar reaction.

In other acute infections our experience has

not been very favorable and I have discontinued this procedure believing it distinctly deleterious.

We maintain a donor list of over three dozen donors, all grouped and all required to have a Wassermann done every six weeks. These donors are mainly university students and young healthy adults. We prefer to use a donor from the same group as the recipient, but in emergency cases we have used universal donors. We require a direct compatibility test of the serum of the recipient against the cells of the donor before every transfusion. Even in cases where two donors are compatible with the recipient before the transfusion and one donor is used for one transfusion, another compatibility *must* be done with the other donor before the second transfusion is given. This is because even though they may be compatible with the recipient, they may not be compatible with each other. The same donor should not be used twice on the patient because of the formation of isoagglutinins.

In a series of over one-thousand transfusions extending over a period of fifteen years, we had 2 per cent of reactions and these were mild. We believe that reactions in the citrate method are not due so much to the citrate as to the exposure of the blood to air and the cooling of the transfused blood. In our experience no reactions are encountered where the compatibility test is properly done and where the blood is drawn and given quickly without allowing cooling to take place. Dr. Percy of the Augustana Hospital in Chicago has had the same experience. In cooling there must be a disturbance in the colloidal chemistry of the blood.

Of the methods devised for blood transfusion, some are of only historical interest. The methods may be grouped (1) the transfusion of modified blood; (2) the transfusion of whole blood.

Of the first group of methods only the citrate method is worth mentioning. There are different modifications of this method, among them the Lewisohn method, the apparatus of Robertson, Jeonbrean and others. The objections to this method are (1) the blood is allowed to cool; (2) a large amount of foreign substance is introduced into the circulation of the recipient.

The methods for the transfusion of whole blood are grouped under (A) Direct, (B) Indirect.

The direct method is mentioned only to be discarded. It is also called vein to vein or artery to vein method and involves blood vessel anastomosis. It is not only objectionable from the point of view of technic, but also for sanitary reasons, for the donor and recipient are brought together.

Of the indirect methods may be mentioned (1) the Lindeman method; (2) paraffin tube method of Percy and others; (3) apparatus with two, three or four way stop-cocks as the Unger, DeLee and others.

Generally, these methods have one or more of the following objections: (1) necessity of cutting into the veins; (2) too small cannulas or too complicated channels, thus facilitating clotting; (3) long exposure of transfused blood to air and to cooling; (4) instability of the cannulas inserted into donor and recipient.

In our opinion the method that approaches nearest the ideal is one that fulfils the following requirements:

1. Simplicity in the construction of the apparatus; such a machine is easy to take care of and keep in working order. It should not have any complicated channels as these promote clotting. The channels must be of such a size that no coagulation can occur.
2. Simplicity in operation which reduces the number of assistants, the number of steps and the amount of mechanical aid.
3. Rapidity of operation.
4. It must be portable, so that it can be carried to the patient's bedside in the hospital or at home.
5. Minimum amount of trauma to the veins, so that they can be used repeatedly; closed methods are, therefore, desired.
6. The cannulas once introduced into the veins must stay securely in place during the operation.
7. The patient and donor must be at a safe distance from each other. This is to prevent contagion.
8. As a corollary to No. 4; the minimum amount of changes allowed in the colloidal chemistry of the blood and the least cooling possible, thus reducing reactions.

It was with a view of meeting with these requirements that we devised a method published in the Journal of Surgery, Gynecology and Obstetrics, November, 1925. I am quoting it in part with some modifications.

TECHNIC

The apparatus for the direct syringe-cannula needle method consists of three 100 cubic centimeter Luer syringes, which usually hold about 150 cubic centimeters of blood, a short piece of rubber tubing, and two cannula needles, one for the donor and one for the recipient. The cannula needle contains an obturator which with the cannula needle is beveled at the end like a spinal needle, and is sharp enough to pierce the skin and the vein with ease. It must be specially emphasized here

that the needle must be razor-sharp as any dull needle tears the wall of the vein. Midway down the cannula needle is a shoulder with a perforation of a size to admit a cambric needle.

The technic of inserting the cannula is as follows: The cephalic or the median basilic vein is used. A small rubber constrictor is set on the recipient's arm and tied tight enough to dam back the venous blood. The recipient contracts the muscles of the forearm to distend the vein. A small cambric needle is inserted transversely to the long axis of the vein, so as to transfix the skin and the anterior wall of the vein. This holds the vein solidly against the skin, and the sharp cannula needle is inserted just below the cambric needle through the skin into the vein. The cannula is set pointing proximally in the arm of the recipient, the obturator is withdrawn and a jet of blood should spurt out of the cannula. The obturator is then put back, and the cannula transfixed by a second cambric needle which passes through the skin on one side, the perforation in the shoulder of the cannula and out through the skin on the opposite side. The constrictor is then released. In recipients in whom the pressure is low, no spurt of blood may be seen. In this case the constrictor is then released and some saline solution is injected into the cannula to see if it is in the vein or not. The same technic of introducing and fixing the needle is used on the donor, except that a blood pressure machine raised to 60-90 mm. of mercury takes the place of the constrictor and that the needle is placed pointing distally. The blood pressure machine is kept at 60-80 mm. of mercury throughout the operation. A Luer syringe is washed in saline solution and rinsed in 2 per cent citrate solution, but no citrate is left in the syringe save what may adhere to the walls of the syringe. The obturator is then removed from the cannula in the donor's arm, and the curved adaptor with its small piece of rubber tubing and glass syringe is attached to the cannula. When the donor contracts his forearm muscles by opening and closing the hand, the blood is easily drawn into the syringe. In fact, without any traction whatsoever, the pressure of the blood will force the plunger upwards as the blood runs into the syringe. After 100 cubic centimeters or more is drawn up into the syringe, it is detached and transferred to the recipient while the assistant draws a second syringeful from the donor. After the syringe has been used, it is again washed in saline solution by the nurse and rinsed in citrate solution. In this way, three 100 cubic centimeters Luer syringes are kept going in rotation, and from 600 to 800 cubic centimeters of blood can easily be transfused in ten minutes. There is, however, no necessity for haste, as the blood does not coagulate within the syringe for at least four or five minutes.

In cases with possibility of infecting the donor, we place the donor in a separate room, one man inserts the needle into the recipient and another man into the donor. The syringes used are discarded and fresh syringes are employed for every syringeful of blood.

Occasionally in patients who are pulseless or whose veins are poor, it may be impossible to enter the vein by this method. A very small incision can then be made through the skin transversely to the long axis of the vein, exposing the vein and a cambric needle inserted through the upper wall of the vein. The cannula needle is inserted into the vein, being transfixed to the skin by a second cambric needle as in the foregoing method. If this method proves unsuccessful in the recipient on account of smallness of the vein, as in a young child, a short longitudinal incision is made through the skin, the vein is lifted and a small oblique incision made, through which an ordinary cannula needle is inserted and transfixed with catgut.

In an infant with an open anterior fontanel, a needle with a small metal knob, so placed that the needle will just reach the superior longitudinal sinus but not go through it, is used. The landmark for inserting the needle is the posterior portion of the anterior fontanel where the two parietal bones meet. The needle is plunged in right up to the metal guard, and if the needle is in the sinus a free flow of blood results. If a free flow of blood does not result, the needle should be placed to one side or other of the original puncture. One must never inject the blood unless there is a free flow of blood from this needle puncture. I have used this simple method of transfusion in infants for many years in a large series of cases without any ill results.

In new-borns, where there is a great deal of over-riding of the parietal bones, the longitudinal sinus may be difficult to find. In these cases we have used the extenral jugular vein, through a transverse nick in the skin down to the vein.

CONCLUSION

Blood transfusion is an indispensable procedure and as a prophylactic measure against questionable risks is of inestimable value in reducing the mortality and should be used more in general surgery as well as in obstetrics, pediatrics and medicine.

A method is hereby presented that has all the requisites outlined above as approaching nearest ideal, namely:

(1) Simplicity in construction and in operation.

(2) Rapidity of operation.
(3) Portable.
(4) Trauma to veins reduced to a minimum so that the vein may be available for subsequent use.
(5) Cannulas are of such a caliber as not to promote clotting and they stay securely in place when once introduced.
(6) Donor and recipient need not be in proximity.
(7) Practically no reactions occur.

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DIPHTHERIA*

B. BERNBAUM, M. D.
DETROIT, MICH.

The higher incidence of diphtheria this past spring and summer, has brought back memories of the sad days several years ago when we were obliged to care for many neglected cases of this disease. It has also stimulated the thought that if the lethargy and indifference continues toward this affliction, we will again be facing the unhappy situation which we formerly experienced. To illustrate my point, the census on the diphtheria wards at the Herman Kiefer Hospital in Detroit, four, five and six years ago averaged about 120 patients, the past three years with the exception of the period I have mentioned, averaged about 35 patients. Therefore there has been a definite decrease in the number of diphtheria patients admitted. In addition to this there were but few severe cases noted. We were beginning to hope that at last this dreaded disease was soon to be conquered. We attributed this success to the advent of generalized use of toxin-antitoxin, and the careful management of diphtheria cases, and their contacts.

The profession was seeing less and less diphtheria, and less and less of severe cases, and so obviously diphtheria began to take a secondary role among acute diseases. The laity soon sensed this condition and the consequence was that an air of indifference arose. Suddenly, an increasing number of diphtheria cases occurred, which soon filled the hospital wards. There arose a cry that the cases were treated early but did not seem to respond to the usual treatment. Two things were blamed for this: one the antitoxin used, it being stated that it was not potent enough and the other: that there was an accompanying or an associate infection present. The first accusation was difficult to prove. We tried several brands of antitoxin with practically similar results. Careful questioning of patients or their relatives in most cases, disclosed that the antitoxin was not administered early enough. The second accusation had a little merit to it, and it resulted in the following investigation:

Thirty-one cases of moderately severe diphtheria gave blood for blood cultures. A bacterium of some sort was isolated six times (during life). Three of these cases were of the hemorrhagic variety, and in all three the K. L. bacillus was found, the other three showed a streptococcus.

The literature shows that about nine investigators have isolated the diphtheria organism from the blood stream during life, and that about 18 others have isolated the K.L. organism post mortem from the heart, blood vessels and various organs of the body. This work shows that there may be a septicemia associated with some of the septic cases of diphtheria.

A detailed report of the above blood investigation is soon to be reported by Dr. E. Martmer of the Herman Kiefer Hospital, Detroit.

This outbreak of severe diphtheria with a high death rate justifies a renewed attack upon this infection.

I am not going to occupy your time with the history of the Klebs-Loeffler infection. The mode of transmission of the infection is of interest. On lead pencils, toys, tumblers, paper money and the like, the organisms can live for several weeks. When the organism is dry and exposed to light it will die in a few hours. When in the dark or more so when protected by a thin film of mucus or albumin, the organism may live for months. This is of significance when we consider the carrier problem. The most common mode of transmission is by direct contact with a case of diphtheria, or a diphtheria carrier.

We are aware of the fact that the K. L. organism manufactures a toxin. This toxin when injected into an animal stimulates the production of antitoxin. The point I want to make is that the antitoxin manufactured by the body is retained much longer than antitoxin introduced into the body.

The incubation period is from one to five days. The onset may be insidious or rapid, usually insidious in the mild cases, and rapid in severe cases. The average case at onset manifests headaches, drowsiness, malaise, temperature 99 to 100, a pulse, usually more rapid than the temperature would indicate, and occasional

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vomiting. The sore throat is not manifest until 12 to 24 hours and even then, there is more of a sense of fulness in the throat rather than actual soreness. The throat is much more sore when the membrane has disappeared. The symptoms indicate that the disease is a toxemia at its inception.

In the severe cases, there is more severe headache, more marked prostration, bachache occasionally, temperature usually higher up to 101 and more rapid growth of membrane. There may be anxiety and delirium.

The average diphtheria patient is dull and apathetic. He desires to be left alone in contradistinction to the streptococcic sore throat where the patient is quite alert, anxious and flushed. The fact that the throat is not actually sore, but dry, full and uncomfortable, diverts attention and allows for considerable progression of membrane growth before treatment is instituted.

The septic cases present a picture of extreme prostration, pallor, and waxy appearance, difficulty in breathing and swallowing, uniform swelling of neck, (bull neck) higher temperature and may show local or generalized hemorrhages with considerable distribution of membrane on the tonsils, pharynx and soft palate.

The laryngeal form is usually secondary to the tonsillar form. The diagnosis is easy when a case with a brassy cough, husky voice presents itself and there is exudate on the tonsils. However, in primary laryngeal diphtheria cases the diagnosis is sometimes difficult. The onset is insidious, the voice husky, there is brassy cough, some temperature, restlessness, irritability and possible infra-sternal retraction.

Most cases of nasal diphtheria show very little constitutional symptoms, and practically no constitutional disturbances or complications. Attention is directed toward these cases by continued nasal discharge or nasal hemorrhages. These cases are sometimes detected by excoriations about the nostrils and face. Here is a type I want to describe. A primary nasopharyngeal diphtheria in which there is considerable growth of membrane in the nasopharynx before it is evidenced in the throat. The first evidence is usually about the uvula growing from behind forward. These cases are often beyond help when seen.

There are types of local diphtheria which may be mentioned: umbilical diphtheria, eye diphtheria, skin diphtheria, wound diphtheria, vaginal diphtheria, etc.

DIAGNOSIS

The diagnosis of diphtheria should not be difficult. A history of exposure is important. A history of Schick test and a history of receiving "T. & A." are important. Given a throat with symptoms as described where there is a uniform membrane present, on one or both tonsils or on the uvula or pharynx, consider the case one of diphtheria. If there is exudate present on tonsils and also on other parts of throat, the case is almost unquestionably one of diphtheria. A membrane in the nose almost always denotes diphtheria. True, a throat may have a uniform membrane and be a phlegmanous sore throat and not diphtheria, or it may be a mixed infection. Here of course, the other symptoms must be taken into consideration, but when in doubt *give antitoxin.*

The differential diagnosis lies between:

1. Follicular tonsillitis, the differentiation here is obvious.
2. Vincent's angina is usually unilateral and is ulcerative, (smear shows typical spirillum and bacillus.) The exudate eats the tonsil, and leaves ulceration upon healing.
3. Peritonsillar abscesses are treated as diphtheria, and visa-versa. The two are differentiated by the amount of swelling constitutional symptoms, history and pointing.
4. Septic sore throat is differentiated by history, constitutional symptoms, temperature and etc.
5. Syphilis: History, constitutional symptoms, ulceration of throat, glandular enlargement, and Wassermann reaction.
6. Post tonsillectomy cases are differentiated by history and appearance.

The laryngeal diphtheria types must be differentiated from:

1. Spasmodic croup which is manifested by no temperature, sudden onset, previous history of such attacks. Laryngoscopic examination if possible. There is usually no hoarseness and the attacks most always occur at night.
2. Foreign bodies are differentiated by history, type of breathing, careful examination of the chest, X-ray and laryngoscopic examination.
3. Papillomata of larynx, are differentiated by history, chronicity and laryngoscopy.
4. Broncho pneumonia. Obvious.
5. Retro-pharyngeal abscesses are differentiated by crow, neck retraction, mass in pharynx, temperature, etc.
6. Poliomyelitis: During epidemics of poliomyelitis certain bulbar cases are mistaken for laryngeal diphtheria. This is due to the fact that these cases are often accompanied by considerable respiratory distress. One must bear in mind the fact that there is an epidemic prevailing, that there is usually post-pharyngeal paralysis, or inter-costal, and diaphragmatic paralysis, instead of infra-sternal retraction as seen in laryngeal diphtheria.

You notice that I have not as yet said any-

thing about cultures. My disappointments with cultures have been very numerous. Do not believe cultures, if membrane is spreading, give antitoxin. Also do not forget that some people are carriers. The rule that I follow is this: Given a suspicious throat, I may take a culture, in most cases, I do not, but I examine the throat again in 12 hours. If the membrane has spread I give antitoxin and so I have beaten the culture by about 12 hours, because it requires about 24 hours to obtain a culture report. I could give numerous examples of very serious errors because of too much faith in the culture report.

The diagnosis of carriers, of course, is almost entirely dependent on cultures. Persistent carriers should have the benefit of the virulence test. The virulence test has no place in acute diphtheria because of the length of time necessary for its completion.

The question of identification of non-virulent strains of organisms, of identification of diphtheroids, of pseudo-diphtherias, B. Hoffman and B. Xerosis must be left entirely to the trained laboratory workers.

PATHOLOGY

The lesions of diphtheria are produced by soluble toxins the products of the activity of bacillary growth. The endotoxin of the substance of the bacilli is also poisonous, but not to the same degree. This substance does not produce paralysis.

Locally, the disease manifests itself, by membrane formation. Ordinarily there is no odor, but when hemorrhage occurs intot the membrane or when there is an associated infection considerable odor may be present. Lymph gland swelling occurs. The toxin produces degeneration and necrosis of epithelium of the lining of blood vessels.

Generally the effect produced is that of systematic degenerative changes. When there is present in the blood stream some antitoxin, the effects are not as far reaching. Upon the heart fatty degeneration of the myocardium occurs which may be slight, localized, or generalized. The destruction may be severe enough to degenerate fibres and even the vagus nerve. Upon the kidneys slight or severe glomerular and intestitial changes may be found as the result of this infection. Upon the nerves the effect may be quite extensive. The toxin probably travels up by way of the perineural lymph stream to the brain producing widespread lesions.

COMPLICATIONS

The most frequent and one seen most commonly is the palatal paralysis. It is seen very early in the second week. (the first paralysis to be noted)and may be caused either by local changes or by the effect of toxin upon the nerve branches supplying the palate. Ciliary paralysis is seen in the third week. It is fairly frequent. Strabismus may be seen but is not frequent. Facial paralysis is very uncommon. Pharyngeal and oesophageal paralyses are fairly rare. They have a gradual onset about the fourth week. Paralysis of the bladder and rectum is rare. Peripheral neuritis is seen between the fourth and sixth week as is intercostal paralysis. Some sensory paralysis is seen occasionally, but is usually a late complication. Cardiac paralysis is almost always seen in the second week. Heart failure may be late, but is usually seen in the second week. The symptoms of heart failure are nausea, vomiting, precordial and epigastic pain, the mentality is clear, sometimes the patient is restless, the extremities are cold and cyanotic, pulse is weak and irregular, and often times not palpable, pulse drop to 20 or 30 is sometimes seen. Death usually occurs in about 24 hours following the onset of these symptoms. The presence of albumin in the urine early in the disease means very little. Later, however, severe nephritis may be encountered. Hemorrhages both local and systemic are seen fairly frequently. Hemiplegia is rare. The glands are involved in most of the moderate and severe cases, but gland suppuration is infrequent. Otitis media is rare and if present is due to secondary infection.

THE PROGNOSIS

The prognosis is dependent upon age, type of disease, duration of illness and complications. Cases with extensive hemorrhage, with marked membrane formation, intubation cases under three years of age, persistent rapid pulse rates and vomiting cases having "pulse drops" bear an unfavorable prognosis.

TREATMENT

The treatment of diphtheria is *"antitoxin"* Given a case of diphtheria, give an adequate dose of antitoxin at once. Further administration of repeated doses of antitoxin seems futile. Park has proved experimentally by repeated examination of the blood after even small doses of antitoxin, that there is an excess of antitoxin present in the blood stream. If one considers antitoxin as a preventitive, rather than a cure for diphtheria the situation clarifies itself. Antitoxin unites only with the free toxin in the blood stream. It cannot separate the toxin which has already combined itself with nerve muscle and parenchymatous organs. Therefore the injury done up to the time that the antitoxin has neutralized the toxin is done and cannot be undone. This point ought to clarify our views on treatment of diphtheria, if for no

other reason, this one is sufficient to give an adequate dose of antitoxin early and stop.

There are three methods of administration of antitoxin: the intravenous, intramuscular, and subcutaneous. It is true that the sooner antitoxin saturates the tissues, the sooner the toxin becomes inert, still the few hours saved by the intravenous route administration is not necessarily life saving, because if the case has reached that point, where but a few hours would determine the issue, it is doubtful if those few hours would really be life saving. The subcutaneous route should be disregarded. Very little difference really exists between the other two. I have had the opportunity of working in two institutions, in one the intramuscular route of antitoxin administration was used almost exclusively; in the other the intravenous route was used almost exclusively. By comparing the morbidity and mortality records of the two institutions, I noted very little difference. The institution where the intravenous method was employed had the benefit of a specially selected, well tested antitoxin for intravenous use. The other institution was dependent upon the average commercial product. The danger of reaction from the controlled antitoxin was much smaller than the danger from the uncontrolled (or commercial product) which accounts for the divergent opinions held by these groups. I have seen but few bad immediate reactions from the administration of antitoxin in either group.

For a time we practised the administration of a few drops of adrenalin at the time of the giving of the antitoxin intravenously. In these cases we saw no bad effects. It would seem that the administration of adrenalin would be efficacious. The giving of antitoxin intravenously does not seem, in my opinion to dissolve the membrane any sooner.

In general I would suggest that the intramuscular administration will answer all requirements to those who do not have the facilities to employ the intravenous technic.

There exists among the laity, and I am sorry to say some practitioners, the idea that antitoxin injures the heart. Nothing is further from the truth, particularly so if one recalls the statement which I first made: that antitoxin is a preventative and not a cure for diphtheria, the damage done by the toxin of the disease, is done, and if the patient is unfortunate enough to have had the toxin unite with his cardiac mechanism, no amount of antitoxin large or small can do harm or good.

THE DOSE OF ANTITOXIN

Generally speaking 40,000 units intramuscularly or 10,000 units intravenously seems to be fully adequate even in the worst cases. Park has proved by experimental work that the cases who receive the doses stated above, carry an excess of free antitoxin in the blood stream for a number of days. One must grade his dose from this high standard downward according to the severity of the case, always remembering, however, that it is safer to lean toward the larger dose than toward the smaller. In Boston the profession still uses very large doses of antitoxin, up to 100,000 or more units with no seeming injury to the patient. Their statistics are no more favorable than New York's where smaller doses are employed.

Rest is the other important therapeutic agent in diphtheria. Absolute quiet and freedom from exertion is sometimes even life saving. Do not allow exertion in any diphtheria case, no matter how mild before eight or ten days. If there is evidence of paralysis keep patient in bed at least three weeks, and even then watch carefully for evidence of further paralysis or myocardial involvement.

The treatment of complications is rest, and general hygienic measures. We have no specific medication to combat neural or cardiac involvements. Strychnia is resorted to occasionally in cardiac cases, its effect is doubtful. Digitalis is contra-indicated in early myocardial involvement because there is already danger of heart block. Caffeine and camphor are used as stimulants. Adrenalin and atropine are serviceable in laryngeal cases. Attention should always be given to free elimination. One should not lose sight of the fact that a plentiful supply of fluid is very necessary.

The treatment of carriers with various local applications seems very unsatisfactory. If the case is persistently positive one should resort to the virulence test. If the organisms are nonvirulent dismiss the patient. If virulent proceed to clear up the throat and nasopharynx, by such surgical means as are deemed necessary. Here is a fact to be noted that an individual with a clean throat and nasopharynx very seldom contracts diphtheria.

Laryngeal diphtheria is treated by an adequate dose of antitoxin, rest, stimulation if necessary, and intubation if the obstruction is acute enough to warrant same, or if there is obstruction and impending cardiac collapse, and the patient's energy must be conserved. I will not go into detail about the technic of this procedure, suffice it to say that it should be left in the hands of an expert. I will say, that direct intubation is practiced sometime when indirect is difficult. In this operation a by-valve laryngoscope is used and the tube is introduced directly. The advisability of tracheotomy should be left to the operator.

In the past three or four years, suction has been employed to relieve laryngeal obstruc-

tion. This measure consists of viewing the larynx, by means of a laryngoscope and sucking out the loose membrane by means of a hard rubber catheter attached to a suction apparatus. This operation is successful in cases where there is loose membrane and comparative slight edema present. There are other means of mechanical relief resorted to by those trained in this work.

Chronic tube cases are treated by dilatation of the stenosed larynx.

PROPHYLAXIS

We will now pass on to the most important consideration in diphtheria, and that is prophylaxis. Prophylaxis in diphtheria is most important because in it we possess very effectual means of eradicating diphtheria.

With the introduction of antitoxin the death rate in diphtheria has been reduced from 150 to 20 per 100,000. With the introduction of the Schick test and toxin-antitoxin and the renewed interest, it stimulated in this disease, the death rate has been cut to one-half or about 10 per 100,000 population. With such potent means of detecting susceptible persons, of preventing and treating this disease, there is no reason why the death rate should not be reduced to a very low minimum.

It seems very difficult for public health departments to compel people to use antitoxin more quickly and more generally than they do now. The general practitioner may aid this situation a great deal by insisting and constantly advising his families that all sore throats must be sent to him for examination. I tell my patients constantly that I want to see all cases of sore throats in the family, and I explain to them how important it is that I see them. One of the advantages of seeing a sore throat early is that the contacts are still in the stage where they can be immunized passively with a small dose of antitoxin. About 1,000 units is sufficient for this purpose. This procedure prevents others in the family from contracting diphtheria, and so diminishes the total number of diphtheria cases. Even if it were possible to educate the laity to recognition of the danger of sore throat and even though each case was treated early, and suitable prophylaxis given, we would still be handicapped by the danger that the carrier could produce. The safest way to deal with the problem would be to prevent people from contracting diphtheria. We have such an agent in toxin-antitoxin.

Before administering toxin-antitoxin, one may resort to the Schick test to determine susceptability to diphtheria. The Schick test if properly done with fresh toxin is a very reliable test. It is within the realm of possibility that a person who is Schick negative with the above conditions fulfilled, still be susceptable to a massive infection of diphtheria, but to all intents and purposes a Schick negative patient is immune to diphtheria. The Schick test briefly consists of injecting intrademally 1/50th M. L. D. of toxin in 1/10th C.C. normal saline. A positive Schick test is noted by a circumscribed area of redness and slight skin infiltration. One to two cm. in diameter which may show up from 12 to 48 hours after injection and which persist from one to three weeks, and which on fading shows scaling and brownish pigmentation. A pseudo-reaction usually shows up earlier, and disappears in about 24 to 48 hours at the most four days. It has more of an urticardial appearance, and covers a larger surface and is redder at the center than at the periphery. To make certain one may use control consisting of heated toxin. An example of the reliability of the Schick test has been demonstrated at all communicable disease hospitals. At the Herman Kiefer Hospital where in former years as many as 10 per cent of scarlet fever patients contracted diphtheria, in recent years all patients were Schick tested, all the Schick positive patients received an immunizing dose of diphtheria antitoxin and the result was that it was indeed rare to find a case of diphtheria developing in a scarlet fever patient during his internment at the hospital.

The Schick test has showed that 15 per cent and less of infants from birth to six months are susceptible. From six to nine months 70 per cent are susceptible. From one year to two years, 80 per cent. Two to five years 65 to 80 per cent. Over 20 years 30 per cent are susceptible. At the present time Schick test material when once mixed for use deteriorates after 24 hours. It is supplied by commercial houses in lots sufficient to test 50 persons, no smaller lots are furnished. For the general practitioner it therefore becomes a very cumbersome and expensive procedure to Schick test all cases. Since almost 80 per cent of children in the pre-school age are susceptible the advisable procedure for the average practitioner would be to resort to the toxin-antitoxin administration without referring to the Schick test.

Soon after the discovery of the fact that the Klebs-Loeffler organism produced toxin and almost immediately after the discovery of antitoxin (1895-1896) investigators observed that animals injected with toxin partially neutralized by antitoxin, became in a measure immune. No human experimentation was attempted at that time. Later on Park was able measure susceptability to diphtheria by testing the antitoxic content of blood, that is testing blood specimens to determine how much, if any, antitoxin was present in the blood stream.

This was of course a tedious and crude test for general use. Park's results showed that two-thirds of the children he tested had no antitoxin in their blood stream. After the discovery of the Schick test, the road was open for toxin-antitoxin experimentation. Behring produced the first "T. & A." mixture. Park and Zingher soon followed in corroborating Behring's report. The standard which Park first used consisted of three L. plus doses slightly under neutralized with antitoxin. It was found that 1/30th of this dose or 1/10th L. plus doses neutralized was just as efficient and far less toxic. Park and Zingher have carried out the most intensive program of immunization in New York City. Their results have been very gratifying indeed. Roughly speaking they have been able to immunize over one-half million children with no serious effects noted.

The injection of toxin-antitoxin is very simple. The State Board of Health in Michigan and other states distributes T. & A. mixture to physicians without cost. The product can also be purchased from any good Biological firm at a very small price. One c. c. of the solution is injected subcutaneously each week for three weeks. Immunity usually appears in from one to six months. About 90 per cent can be made immune with the one series of injections. More than half of the remaining 10 per cent can be immunized with a second series of injections. A few will not respond to the second series and require a third. As the result of the use of toxin-antitoxin in the past four years, the mortality in diphtheria has been reduced from one-half to one-third of its former incidence. Retests in many instances 10 years after injection, still show the persons immune.

There has been a little objection raised to the use of toxin-antitoxin because it contains horse serum, which tends to sensitize persons. Although a slight amount of sensitization is possible, there have been but very few instances of such sensitization seen. *The Journal of the American Medical Association,* March 27, 1926, contains the results of a five-year investigation with T. & A. prepared according to the Park technic in which no appreciable clinical or laboratory sensitization to horse serum was noted.

To summarize toxin-antitoxin: we may state that it is easily procured, entails no expense, keeps well, is safe to administer, does not sensitize and is from 90 to 98 per cent efficient. In the face of these facts there should be little objection to its general use. Zealous workers have even made attempts to obviate the little objection raised to the fact that antitoxin is present in T. & A. mixture.

The result of their work has been the production of toxoid, which is toxin detoxified with formaldehyde. In addition to the fact that it obviates sensitization it seems to produce immunity more rapidly, that is in about four weeks to three months.

Larsen of Minnesota has a product which is similar to his scarlet fever toxin. It contains toxin in a 2 per cent castor oil soap solution. This solution when injected intramuscularly is absorbed very slowly (about 72 hours) thus enabling the giving of a larger dose of toxin in one dose. This obviates the giving of three injections, when one seems to be sufficient.

In my conclusion I want to include the plea and resolution of Recent American Health congress:

"Ten thousand lives are sacrificed needlessly from diphtheria in the United States each year." Ninety per cent of these deaths occur in children under five years of age. Science has now given to us a means whereby complete protection against this disease may be secured by the administration of toxin-antitoxin. The vast majority of people so immunized will never contract diphtheria even though exposed to it. Ten years of experience have proved the entire practicability of eliminating diphtheria from a community by widespread immunization of school children and more particularly of children of from one to five years of age. Therefore be it: Resolved that the health workers of the country assembled in the American Health Congress, with the best interest of the children of America at heart, strongly urge upon the people of the United States the opportunity thus afforded them of banishing diphtheria as a menace to their children, and be it:

Resolved, that this congress urge upon fathers and mothers of the land that they seek this protection for their young children either from the family physician or by taking advantage of the immunization services offered by boards of health, clinics, health centers and boards of education, to the end that diphtheria may be eliminated from our nation.

My plea is to the practitioner to carry into his families the gospel of prevention of this needless disease. The influence of the physician is far reaching, he can do much to convince the community in his own quiet way of the importance of the sore throat, its early recognition, its proper treatment and the like, but most of all he can do a great deal as a lone campaigner to encourage the use of toxin-antitoxin to the degree that diphtheria will become a rare disease.

THE SPAN OF LIFE*

W. A. EVANS, M. D.
CHICAGO, ILL.

What is the span of life?

The ordinary man would be disposed to answer this question from an individual standpoint by saying: the span of my life is the time which will elapse between my birth and

* Read at Annual Meeting, September 1926.

death, or in another way. It will be my age at death.

But more than one variation of this answer has been proposed. Dr. William H. Welch, speaking at a banquet given Dr. Stephen Smith, when more than 99 years old, said that the old father of preventive medicine had already had a span of life of more than 100 years. "Because," said Dr. Welch, "the span of life began with conception and not with birth."

While this is true, it is not practicable to estimate the span of life on that basis. There are legal formalities, the registration of births, medical service, and other social and economic methods of establishing the date of birth. There are none such which can be used to establish the date of conception.

The simplest way of establishing the average span of life, or the span of life of the average man, is to average the ages at death, as shown on the death certificates. This method gives what might be termed the crude span of life, using a phraseology that is akin to the one used for death rates—the crude death rate. Scientific statistians will apply what they call corrective factors and from them they will obtain the expectations of life at different age periods, in different regions, for the different sexes, for different occupations, and so forth.

There is a relationship between death rates and the span of life of a community. If this relationship between these two—span of life and death rate—was perfectly adjusted in all of their ramifications, the span of life could be used to estimate the death rate, and the death rate could be used to estimate the span of life. Let me illustrate.

Dr. L. I. Dublin (Nation's Health, April, 1923, Vol. V, p. 189) says: "In 1920, the span of life in the registration area of the United States was over 55 years. The gross death rate in the registration area of the United States in 1923 was 12.3 per 1,000." For purposes of calculation, let us take a death rate of 12 as being normal. This means that one eighty-fifth of the population died in the year in question. Theoretically, this means a span of life of 85 years. But the span is 55. Conversely, if the span is 55 years, the death rate should be 18. Why the discrepancy?

The reason lies in the instability of the population. Population is the yardstick by which the death rate is determined. So long as this yardstick is instable, the relationship between deathrate and span of life cannot be close and accurate.

A stable population is one where the death rate equals the birthrate; the immigration rate equals the emigration rate; and where there is either no movement of inhabitants from one statistical unit to another, or where those who move out of one unit are equal in number to those who move in. In an ideal arrangement, this status quo must be maintained for several years for what might be termed a settling process; the emigration must be of the same average age as the immigrants; and those who move into the unit must average as old as those who move from it.

For the time we would be satisfied to stabilize by equalizing births and deaths; emigration and immigration, and population movement within the country. In time we shall have satisfactory correction factors for stabilizing by calculation. This will necessitate a factor for excess of birth over deaths, another for change in age due to immigration and emigration, and a third for the change in age due to internal movement of population. Of the three, the only one which will be difficult is that due to internal movement.

With such a normal rate, it would be possible to use the average age at death as shown by the death certificates, and from that to calculate both the span of life and the normal death rate for a community.

GRADING HEALTH DEPARTMENTS

With such a normal rate, it would be possible to grade health departments on the basis of death rates. At the present time it is not.

Very much the largest factor in fixing death rates now is the average age of the population and the distribution of the population into age groups of different sizes. Some of us recall the controversy a number of years ago between Dr. Tuttle, then health officer of the state of Washington, and Professor Wilcox. The controversy was over the low death rate of Washington. "Unnatural" said Wilcox. "Yes, but to be expected, with the age distribution of our population," replied Tuttle.

Table 1 and Figure 1 show the influence of age distribution on death rates. These tables and charts are taken from Glover's "U. S. Life Tables for both sexes in the original Registration Area—1910."

Using 12 per 1,000 as the normal death rate, we find that all children two years old and under, have death rates higher than that figure. The same is true of all persons 46 years old and older. The death rate for all ages between 2 and 46 is lower than 12.

Theoretically, if the average age of the population was 35, the nominal death rate would be 8.04. If the average age of the population was 58, the normal death rate would be 24.97.

Very special distributions of population in certain age groups would disturb these figures

somewhat. For instance, let us suppose a sudden and enormous influx of babies under 1 by the birth route and other routes as well. By reason of the very high baby death rate, this change in population would affect the death rate more than it would the average age.

Nevertheless, the facts are near enough right to warrant the statement that the average age of the population is the largest factor in determining the death rate—outranking any of the activities of the health department, or all of them.

The death rate of Chicago in 1917 was 14.79. Due to the great influenza epidemic the rate of 1918 was 17.01. No other event in the last quarter of a century has been so drastic, from the epidemiological standpoint, yet we note that a shift in the average age from 47 to 53 would cause an even greater increase in the death rate.

For a considerable number of years, the age distribution of the population has kept us in the serene waters represented by the age periods 3-48. In this calm bay there are stretches where the nominal death rate changes very little from year to year. With a span of life of 55 years, a falling birth rate, a falling excess of births over deaths, and with sharp limitations of immigration, we will soon pass out of these calm waters. We will presently reach a period of average age where, not only will a death rate of 13 and over be normal, but where the increase due to a single year of increase in average age will be marked. To illustrate: Should the average age of the population jump from 55 to 56 years, the jump in death rate of 1.69 per 1,000 would be normal. We now boast of a change of a fraction of an inch. We must frankly confess that our data for age distribution and population and average age of population must be improved before we can make much practical use of all this.

The 1920 and 1910 census gave the age distribution of the population between birth and 100 years, distributed in 5 year groups. From this, it is possible to calculate the approximate average age of the population.

A calculation of the average age of the Chicago population in 1920 and 1910 indicated that Chicago has a population that averages very young and, therefore, should have a low death rate, and that the average age is increasing every decade. But this calculation is far from accurate or satisfactory in any way.

A second table gives the population 25 and under, distributed by single years. If the census of 1930 could distribute the population in one year groups it would be easy to calculate average age and thereby obtain a proper age basis for calculating corrected death rates.

THE INCREASING SPAN OF LIFE

What is the evidence that the span of life is increasing? Of this, there is ample. We limit our quotations to some from Dublin (loc. cit.). He says: "In the registration area of the United States we find an increase of six years in the span of life between 1901 and 1920. In 1920 the span was over 55 years, or a gain of more than 15 years in the course of 65 calendar years.

In a hypothetical life table, which he thought attainable by the application of procedures then known, there should be an expectation at birth of 64.75 years. Before many years the biblical span of life to three score and ten applied originally to the individual man will apply to the average man.

Dublin says: "At the time of the last expectancy table, for England, 43.5 per cent of males, and 51.2 of females attained age 65.

THE SPAN OF EFFICIENT LIFE

This raises the question: Is there increased efficiency of the people who are 65 years old and over? Obviously, we cannot chloroform people who pass 50. We remember some unpleasant notoriety which followed one of Osler's jokes about that. Nothing is gained by prolonging the span of life unless there is a prolongation of the span of efficiency. On this point Dublin says: "As 65 is the age which closes the active working period of life, it must be obvious that that nation is the most productive, and its people enjoy the largest measure of longevity and, shall I add, prosperity, which can bring the largest proportion of its people to the threshold of old age."

There is no way of proving that the span of efficient life is keeping pace in its increase with that of the span of life. In truth, there is no way of proving that the span of efficient life is improving at all. And yet I am assured that as the result of our observation, common knowledge and common sense, we are all in agreement in sensing that the span of efficient life is now more than a decade longer than it was say in 1876. If this is accepted as true, two questions arise. The first is: what can we do to increase the health, comfort and efficiency of people of middle life and beyond? The second: what adjustment of social and business conditions is made desirable by the changing order?

First: In the introduction to Stanley Hall's "Senescence" (age 40 to 60); and "The Care of Senectitude" (age 60 to 100), speaking of his own quest for information, he said:

"This hygienic survey reinforced what I had realized before, namely, that physicians know very little of old age. Few have realized its destructive needs as they have in the dis-

eases of women and children and the rest. Thus, the older a man is the more he must depend upon his own hygienic sagacity for health and long life. Now that the average length of human life is increased and there are more and more old people, there is more need of studying them, just as in recent decades children have been studied—for medically, after the climatic, they constitute a class in the community that is somewhat alien, its intrinsic nature but little known, and the services it was meant to render but little utilized."

The outstanding diseases of these older age periods are the members of the cardiovascular group: heart diseases, kidney diseases, blood vessel diseases, including apoplexy, pneumonia and cancer. The cardiovascular group are more important because of the inefficiency they engender, than they are because of the deaths they cause.

Fisk calls them the "Silent Diseases" because they cause so many deaths as compared with the report of illness.

In a study of sickness in Hagerstown, Maryland, made by the United States Public Health Service, it was noted that the diseases of this group caused 34 per cent of all deaths and 3.2 per centage of all illness discovered. Fisk (How to Live, August, 1926), commenting on this report says: "It is a remarkable fact that the diseases chiefly responsible for death, are a negligible factor in the sickness rate. This fact causes Fisk to call this group of grave organic disorders—"The Silent Sickness." He says: "These silent sicknesses have come to be the most important that we have to deal with."

In this study, the organic degenerative diseases appeared to have a death rate that was out of proportion to the sickness rate. The lack of proper proportion was due to the fact that reported illness, rather than actual illness, was the basis of the study.

Much illness that was actual was not reported because neither the people nor the physicians know the importance of the variations from comfort and capacity which indicate organic degenerative diseases in the very early stages. These diseases are "silent" in the same sense that the air was silent before the discovery of the radio. They are silent because we do not know their wave lengths or, if we know them, we do not tune in on them. One of the changes which will come shortly is the practice of habitually tuning in on the right wave length for this group of disorders.

The increasing span of life and our future campaigns to increase the efficiency of life in its later decades brings into view a new objective for the physician and his patient. Men and women 50 and beyond are sclerotic in their organs and are creaky in their joints. They are stiff and without muscle tone and general physical, mechanical resiliency. A by-product of the hygiene of living, which will be followed to prevent cardiovascular diseases, will bring men to 60 more supple, less creaky, less sclerotic an dmore enduring than they now are. But for this to come about, physicians must develop a new science and probably a new specialty.

The last point is this: Social customs, particularly those which relate to employment, are under the influence of the past. It was good judgment 50 years ago to hold that people 50 years of age and over were unemployable. To hold that now is an instance of the long arm of the past reaching out and resting on customs to which it should not apply.

The increasing span of life, and the increasing span of efficiency calls for a readjustment of the rules of employment. We must reassign jobs and, in that way, create fields for the effective use of large numbers of men women 65 to 80 years of age. This will be economically sound and, at the same time, just and human.

1920 Average age	28.58
1910 Average age	27.41
Total expected deaths in Chicago in 1920	28,731
Expected death rate in 1920, according to Glover's table	10.65

AGE DISTRIBUTION OF POPULATION OF CHICAGO BY FIVE-YEAR GROUPS

Age Group	1910	1920
All ages	2,185,288	2,701,705
Under 5	223,767	272,455
5 to 9	191,294	258,229
10 to 14	185,709	223,042
15 to 19	208,268	201,864
20 to 24	250,817	246,824
25 to 29	236,747	291,369
30 to 34	194,941	263,852
35 to 39	172,512	235,730
40 to 44	145,261	180,312
45 to 49	119,295	154,518
50 to 54	90,469	126,795
55 to 59	56,169	89,793
60 to 64	41,478	66,949
65 to 69	27,569	38,570
70 to 74	16,923	23,919
75 to 79	9,407	13,549
80 to 84	4,237	6,176
85 to 89	1,602	2,250
90 to 94	400	571
95 to 99	71	135
100 and over	19	25
Unknown	8,138	4,778

Under 1	114.62		
1— 2	27.62		
2— 3	12.34		
3— 4	7.83		
4— 5	5.65		
5— 6	4.66		
6— 7	3.91		
7— 8	3.3		
8— 9	2.82		
9— 10	2.47		
10— 11	2.27		
11— 12	2.19		
12— 13	2.22		
13— 14	2.36		
14— 15	2.57		
15— 16	2.84		
16— 17	3.16		
17— 18	3.52		
18— 19	3.89		
19— 20	4.28		
20— 21	4.68		
21— 22	5.		
22— 23	5.19		
23— 24	5.29		
24— 25	5.42		
25— 26	5.54		
26— 27	5.67		
27— 28	5.85		
28— 29	6.06		
29— 30	6.28		
30— 31	6.51		
31— 32	6.78		
32— 33	7.09		
33— 34	7.4		
34— 35	7.72		
35— 36	8.04		
36— 37	8.33		
37— 38	8.59		
38— 39	8.84		
39— 40	9.11		
40— 41	9.39		
41— 42	9.72		
42— 43	10.09		
43— 44	10.52		
44— 45	10.99		
45— 46	11.52		
46— 47	12.08		
47— 48	12.63		
48— 49	13.18		
49— 50	13.77		

50—	51—	14.37	
51—	52—	15.08	
52—	53—	16.01	
53—	54—	17.17	
54—	55—	18.49	
55—	56—	20.03	
56—	57—	21.72	
57—	58—	23.37	
58—	59—	24.97	
59—	60—	26.73	
60—	61—	28.58	
61—	62—	30.62	
62—	63—	32.96	
63—	64—	35.55	
64—	65—	38.25	
65—	66—	41.06	
66—	67—	44.08	
67—	68—	47.41	
68—	69—	51.12	
69—	70—	55.14	
70—	71—	59.52	
71—	72—	64.29	
72—	73—	69.38	
73—	74—	74.82	
74—	75—	80.78	
75—	76—	87.37	
76—	77—	94.35	
77—	78—	101.74	
78—	79—	109.78	
79—	80—	119.16	
80—	81—	130.28	
81—	82—	142.17	
82—	83—	153.06	
83—	84—	162.5	
84—	85—	172.97	
85—	86—	183.8	
86—	87—	194.85	
87—	88—	206.84	
88—	89—	220.13	
89—	90—	234.3	
90—	91—	249.62	
91—	92—	264.66	
92—	93—	279.9	
93—	94—	295.12	
94—	95—	310.17	
95—	96—	325.02	
96—	97—	339.74	
97—	98—	334.55	
98—	99—	369.73	
99—	100—	385.46	
100—	101—	401.91	
101—	102—	419.14	
102—	103—	437.37	
103—	104—	456.77	
104—	105—	477.48	
105—	106—	500.22	
106—	107—	524.82	

SUNLIGHT AS A DISINFECTANT

F. M. MEADER, M. D.,
Director, Medical Service, Detroit Dept. of Health.*
DETROIT, MICH.

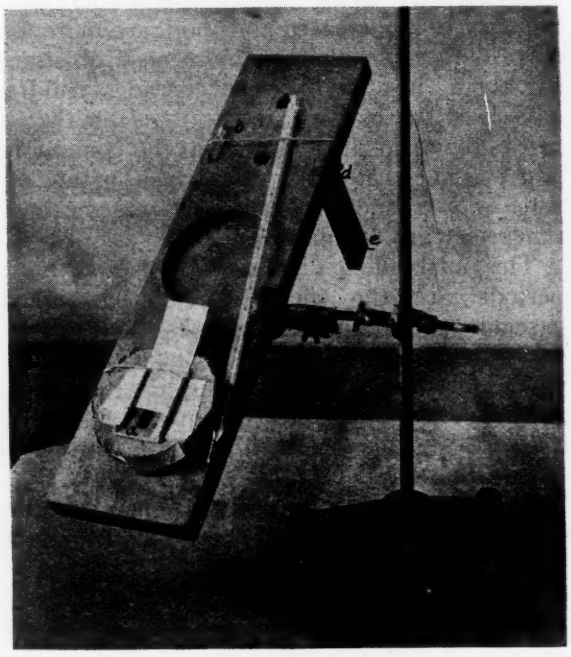
The importance of sunlight as a disinfectant has been realized for a long time, but exact knowledge as to how much power to destroy bacteria the sun's rays possessed has been a matter of conjecture. What part of the sun's rays were bactericidal has only recently been investigated. This information has not yet become general, and directions have been so vague that no considerable number of medical authorities have ventured to make intelligent use of these rays. It was for information of this kind that the following studies were undertaken.

EXPERIMENT I

Does the Direct Sunlight Kill Bacteria and if So How Long Does It Take?

A petri dish is half filled with nutrient agar-agar. This medium is then smeared with staphylococcus aureus. The glass cover is replaced by a paste board cover, provided with a fenestra 1 cm. wide and 5 cm. long. This opening is covered with a quartz glass through which the direct rays of the sun pass on to the bacteria beneath. In order to learn about the length of time necessary to expose the bacteria to the sun in order to kill them, a card is placed under the quartz glass, but over the benestra in the card-board. The card is so placed that during the first half hour only about 1 cm. of the fenestra is open. At the end of each half hour period the card is withdrawn 1 cm., indicated by small perforations in the card-board by the side of the fenestra. (See Figure 1.)

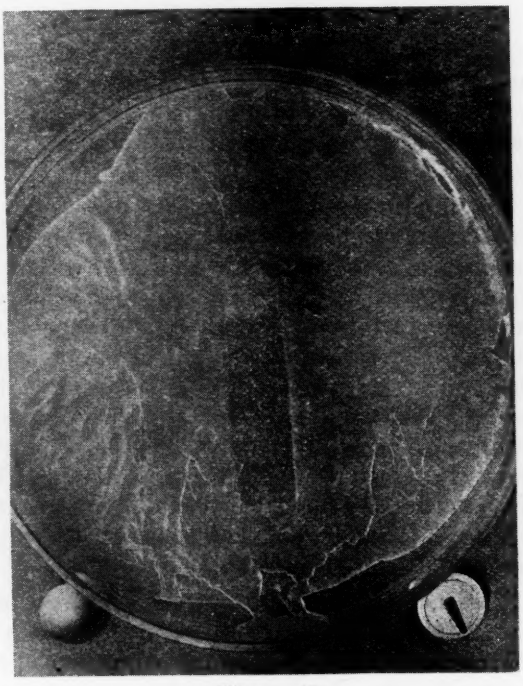
A thermometer is placed near the petri plate in order to register the temperature of the surrounding atmosphere. This arrangement is placed outside the window facing the sun.



(Figure 1)

Support for holding materials in the sun. (a) Culture plate. (b) Quartz tube containing standard methylene blue solution. (c) Thermometer. The shadow of the nail at (d) is made to fall on the nail (e).

After exposure, the card-board cover is replaced by the original glass cover and the petri dish is then placed in the incubator, at body temperature. The next morning a good growth appears on the medium except where the sun's



(Figure 2)

Petri dish showing clear area where Staphylococcus Aureus has been killed by exposure to direct sunlight.

* Read before Wayne County Medical Society, May 11, 1926.

rays have killed the bacteria. In this latter place the medium is clear. (See photograph. Figure 2.)

Table showing bactericidal effect of direct sunlight. December 26, 1924. Latitude 42°15'. Elevation above sea level, 800 feet.

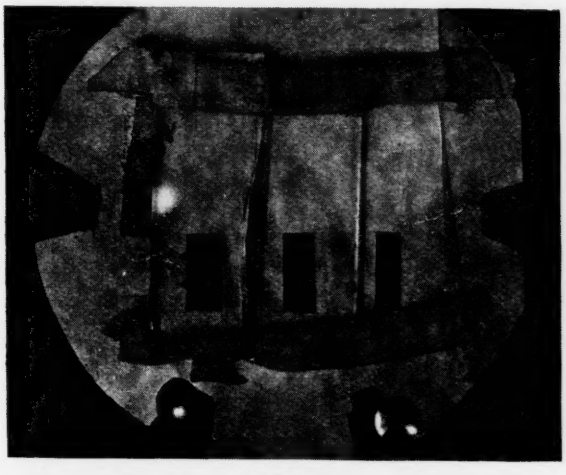
Hour	Temperature	Results on area exposed to sun
10:30 a. m.	23 degrees F.	No growth
11:00 a. m.	23 degrees F.	No growth
12 noon	23 degrees F.	No growth
12:30 p. m.	23 degrees F.	No growth
1:00 p. m.	23 degrees F.	No growth
1:30 p. m.	23 degrees F.	Faint growth
2:00 p. m.	23 degrees F.	Good growth

Result: One hour's exposure of staphylococcus aureus to direct sunlight, regardless of freezing temperature which surrounds the medium, will kill this organism.

EXPERIMENT II

Will Direct Sunlight, Passing Through Window Glass Kill Bacteria?

A petri dish containing nutrient agar-agar which was smeared with staphylococcus aureus, is prepared as in Experiment 1. The card-board cover in this experiment contains three fenestrae. One is covered with plate glass 8 mm. thick; the middle fenestra is covered with window glass 4.5 mm. thick; and the third fenestra is covered with a piece of photographic plate glass .8 mm. thick. The length of the fenestra is regulated at intervals by drawing the card out as in Experiment I. (See Figure 3.)



(Figure 3)

Card-board cover for a petri dish, which contains three fenestrae each covered with crown glass. The glass on the left is 8mm. thick; the middle glass is 4.5 mm. thick; and the glass on the right is .8 mm. thick.

The result is indicated on the following table:

Table Showing Bactericidal Effect of Direct Sunlight on Staphylococcus Aureus, When Passed Through Glass of Various Thickness.

Jan. 9, 1925 Latitude 42°15' Elevation-800' Temp. 36°F.

Hour	Time	Result on Areas Exposed to Sunlight		
		Thick Glass	Window Glass	Thin Glass
11:00 a. m.	6¼ hrs.	No growth	No growth	No growth
12 noon	5¼ hrs.	No growth	No growth	No growth
1:30 p. m.	3¾ hrs.	Faint growth	No growth	No growth
2:30 p. m.	2¾ hrs.	Some growth	Faint growth	No growth
3:30 p. m.	1¾ hrs.	More growth	Some growth	No growth
4:30 p. m.	¾ hrs.	Good growth	More growth	Some growth
5:15 p. m.	0 hrs.	Good growth	Good growth	Good growth

From the above table it will be apparent that the sun's rays shining through the thick plate glass kills staphylococcus aureus in a period of four to five hours; shining through window glass killing was complete in 3¾ hours; and through thin glass killing was complete in 2¾ hours.

The point to this experiment is that we do get pronounced bactericidal effect, although delayed, when the sunlight passes through glass.

EXPERIMENT III

Does Indirect Sunlight Have Any Bactericidal Power?

The apparatus and method used in Experiment I is used, except that the petri dish is made to face the northeastern sky, on a bright sunny day, so that no direct rays of the sun enters the dish. The results are expressed in the following table. Also see photograph of plate from which record was made.

NOTE: The area showing bactericidal effect is wider than the fenestra in the cover.

Mar. 23, 1925 Latitude 42°15' Temp. 55°F. Elevation 800'

Hour	Time	Result
10:20 a. m.	6 2-3 hrs.	No growth
11:30 a. m.	5½ hrs.	No growth
12:20 p. m.	4 2-3 hrs.	No growth
1:30 p. m.	3½ hrs.	Some growth
4:10 p. m.	50 min.	Good growth
5:00 p. m.	0 hrs.	Good growth

From this experiment it is apparent that indirect sunlight does have a very marked bactericidal effect. In about four hours, the same effect is obtained that appeared with one hour of direct sunlight.

EXPERIMENT IV

Is the Sunlight More Effective During a Particular Part of the Day?

The same apparatus used in Experiment I is employed except that in place of a card to control size of the fenestra in the cover, a long card with a hole 1 cm. square near the middle is placed under the quartz glass so that the square hole is located over the lower part of the fenestra in the cover at the beginning of the experiment. At intervals this card is pulled up so that the light falls on a different surface

of the medium during succeeding hours. The results are indicated in the following table.

Mar. 26, 1925 Latitude 42°15′ Temp. 75° Elevation 800′

Hour	Time	Result
8:50 to 9:50 a. m.	1 hour	Little growth
9:50 to 11:20 a. m.	1½ hour	No growth
11:20 to 12:20 p. m.	1 hour	Considerable growth (cloudy)
12:20 to 1:20 p. m.	1 hour	No growth
1:20 to 2:20 p. m.	1 hour	No growth
2:20 to 3:20 p. m.	1 hour	Little growth
3:20 to 4:20 p. m.	1 hour	Good growth
4:20 to 5:20 p. m.	1 hour	Good growth

From this table it is apparent that the sun's rays became effective between 8 and 9 o'clock in the morning, and continued up to about 3 o'clock in the afternoon, after which there is practically no bactericidal power. The reason for this will be apparent later.

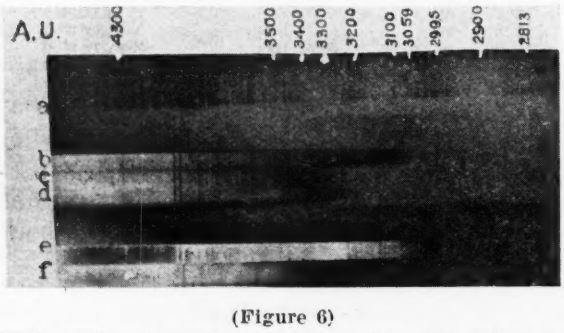
EXPERIMENT V

What Is It in the Sun's Rays That Kills Bacteria?

To answer this question our work was transferred to the physics department of the University of Michigan. A large size, and a small size, Hilger spectroscope together with arc lights and suitable quartz lenses, were made available.

A photograph of the solar spectrum was taken at about noon, October 28, 1924. (Figure 6.) The result indicates that the shortest wave length is 2998 Angstrom units. To express it simply, the wave length is nearly three ten-thousandths of a millimeter, or 299.8 millimicrons in length. This is in accordance with other well known observations of the kind.

The photographic plate upon which this picture was taken, is 10 x 4 inches. An old plate was cleaned and sterilized by heat. Then a tube of melted nutrient agar-agar was poured over the surface of the plate so that the



(Figure 6)

Photograph of spectrum (a) iron arc, (b) solar, (c) solar light through plate glass, (d) solar light through window glass.

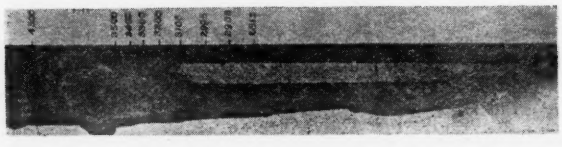
medium was about one-eighth inch thick. When the medium has hardened a heavy suspension of staphylococcus aureus was painted over the surface of the agar. The plate was then placed in the plate holder in such a way that the surface of the agar-agar occupied the same plane that would be occupied by the surface of a photographic plate. The plate holder was then placed in the spectroscope so that the spectrum was focused on the surface of the medium. Since it was difficult to hold a heavy instrument of this kind so that the sun's rays were always parallel to the axis of the collimator, the difficulty was obviated by using a stationary arc lamp as a source of light. Light waves of the same length and intensity from whatever source should react the same. Since the spectrum of an iron arc has certain characteristic lines which are easy of identification, an arc lamp with iron terminals was used as a source of light. The spectroscope contained a quartz prism so that short waves down to about 2200 A. U. were apparent on the photographic plate.

When the plate with the bacteria on it had been exposed to the spectrum for a given time, it was removed and placed in a moist chamber of an incubator at body temperature for over night. There appeared a luxuriant growth except where the bacteria had been killed by the rays of light in the spectrum. After incubation, the plate was fumigated with formaldehyde gas and the culture medium was allowed to dry. Then a photographic negative of the spectrum of an iron arc was superimposed on the dried culture in order to identify the wave lengths which killed the bacteria. The following table indicates the longest light waves which were observed to kill the organisms.

Organism	Period of Exposure
Staphylococcus Aureus	30 minutes
Staphylococcus Aureus	1 hour
Staphylococcus Aureus	2¾ hour
Staphylococcus Aureus	5 hours
B. Typhosus	1 hour
B. Diphtheria	20 minutes
B. Diphtheria	1½ hour

Range of Lethal Light Waves noted on the above.

2850 A. U. to 2300 A. U.
2950 A. U. to 2411 A. U. and below
3000 A. U. down
3100 A. U. down (See Fig. 7)
2950 A. U. to 2480 intermittent
2700 A. U. to 2490 intermittent
2700 A. U. to 2490 intermittent



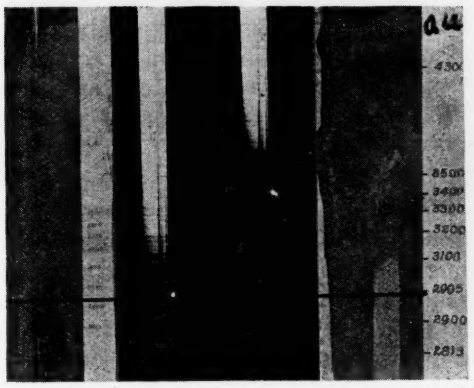
(Figure 7)

Culture of Staphylococcus Aureus exposed 5 hours to spectrum of an iron arc. Current—8 amperes, about 10 volts. Terminals 6 mm. in diameter. A quartz lens 3½ inches in diameter with 8-inch focal length, focused light on slit of spectroscope. The slit was 5 mm. in width.

From the above table it will appear that with limitations, the longer the exposure, the longer wave lengths may be effective in killing bacteria. For periods of 30 minutes, wave lengths of 2850 A.U. and shorter, may be effective. For periods of one hour, a wave length of 2950 A.U. and below may be active; while for longer periods of five hours, a wave length of

310 A.U. will kill bacteria. Bernard and Morgan with an eleven ampere current were able to produce a bactericidal effect with light waves up to 3287 A. U.

The following photograph (Figure 8) correlates the solar spectrum with the bacterial cultures which have been killed by the arc spectrum. Further discussion will be found in report of next experiment.



(Figure 8)

(a) Culture Staphylococcus Aureus exposed to spectrum of iron arc for three hours. Clear area shows where bacteria have been killed. (b) Spectrum of sun at noon, April 1, 1925. (c) Spectrum of solar rays which have passed through plate glass 6.0 mm. thick. (The white dot indicates the position of the shortest line on the negative.) (d) Culture staphylococcus Aureus exposed to iron arc spectrum for five hours.

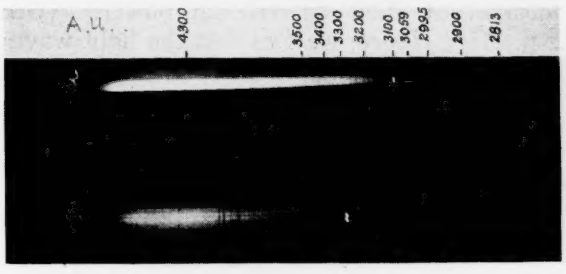
The clear area shows where bacteria have been killed. The solar spectrum extends down to the horizontal black line. The clear areas on cultures above the horizontal line indicate the upper range of the arc spectrum which has bactericidal property. (See a and d).

EXPERIMENT VI

Do These Short Waves in the Suns Rays Vary in Amount During the Day?

The solar spectrum above mentioned was taken about noon on April 1, 1925. The shortest wave noted was 2995 A.U. A photograph was taken of the solar spectrum again at 7 o'clock in the evening, when the sun was just above the horizon. (See cut—Fig. 9.) The shortest wave length was about 3100 A.U.

This is in confirmation of the idea that the atmosphere absorbs the short light waves before they reach the earth. Since the minimum thickness of the atmosphere through which the sunlight passes is at noon, we may expect the greatest penetration by the shortest waves at about noon; they are absent during the late afternoon, as indicated in Figure 9.



(Figure 9)

Photograph of (a) solar spectrum at 7 p. m., April 1, 1925. Latitude 42° 15′. Elevation 1,000 ft. above sea level. (b) Same as (a) except that light passed through window glass 4mm. thick.

These experiments indicate that (a) solar light wave lengths of 2995—3100 A. U. are present during the middle of the day, but are absent during the latter part of the day; (b) in Experiment V it was noted that these light waves had bactericidal properties; (c) in experiment IV it was noted that the sun's rays have bactericidal power only during the middle of the day.

We may, therefore, conclude that the part of solar light which has bactericidal properties, is that part of it which has a wave length shorter than 3100 A. U. If the light is sufficiently intense, waves which are a little longer may be effective. This conclusion shoudl not preclude the possibility of longer waves being effective on organisms sensitized by fluroescent substances—a subject which needs further observation.

EXPERIMENT VII

Does Window (Crown) Glass Prevent These Short Light Waves Which Have Bactericidal Effect, From Entering a Room?

This experiment was divided into two parts. Part A required *light from an arc lamp,* such as above described to pass through glass of various thickness before entering the spectroscope when a photograph was taken of its spectrum.

Part B required *sunlight* to pass through glass of varied thickness before entering the spectroscope, when a photograph was taken of its spectrum.

Part A—A photograph of the spectrum of zinc-cadnium spark was first taken for purposes of identifying spectral lines of a given length. The photographic plate was then moved so that a different part of the same plate could be exposed. A piece of window glass was then placed in front of the slit of the spectroscope. A beam of light from the spark was then allowed to enter the spectroscope and its spectrum was recorded on the photographic plate. (See Fig. 10.)

Part B—A photograph of the spectrum of an arc was first taken for purposes of identifying light waves of a given length. Then the instrument was placed in the sun so that a photograph of the solar spectrum was taken. Then the sunlight was passed through glass before it entered the spectroscope, and a photograph was taken. The following table summarizes the results of these two experiments. (See Fig. 11.)

Table showing shortest wave lengths which passed through glass:

Part A

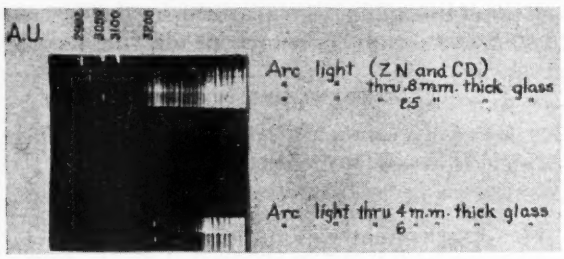
Source of light	Thickness of glass	Shortest wave length identification lines
Spark (cd. and zn.)	8 mm.	3000 A. U.
Spark	2½mm.	3059 A. U.
Spark	4 mm.	3200 A. U.
Spark	6 mm.(plateglass)	3200 A. U.

Part B

Sunlight		2992 A. U.
Sunlight	4 mm.	3110 A. U.
Sunlight	6 mm.	3180 A. U. about

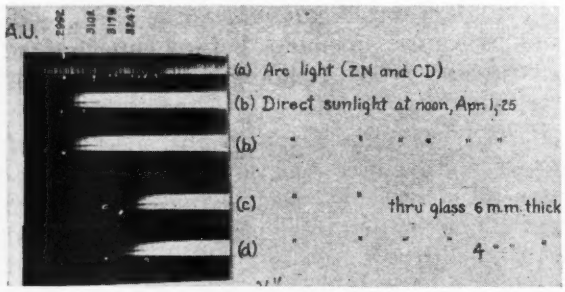
(See Figures 10 and 11)

From the above table it will be apparent that these solar short waves (2992 to 3110 A.U.) are strongly absorbed by window glass. Yet, from Experiment II it was evident that bactericidal power does occur from the light waves which pass through glass, *but a long time is required.* It is probable that the few seconds period of exposure to the photographic plate is not sufficient to register the shortest waves which would pass through the glass in three to five hour. While we have no evidence from



(Figure 10)

Photograph of arc spectrum after it has passed through glass of varied thickness. The photograph has been touched with a white dot to indicate the shortest wave length which is visible in the photographic plate.



(Figure 11)

Photograph of spectrum. (a) arc light, (b) solar light, (c) solar light through 6 mm. thick window glass, (d) solar light through glass 4 mm. thick. White dots indicate the shortest wave length which is visible on the photographic plate.

this experiment that these light waves do pass through glass, yet Experiment II indicates that they must pass through because of the bactericidal effects which ensue when sunlight passes through glass.

EXPERIMENT VIII

Is There Any Simple Method of Detecting the Presence of These Short Waves in Sunlight?

The observation has been made that methylene blue, dissolved in acetone will bleach out in the presence of these short light waves. A standard solution of methylene blue was prepared as follows:

Sol. A.	1% methylene blue	5.8 cc
Sol. B.	Acetone	30. cc
Sol. C.	Distilled water	64.2 cc

(London Lancet, April 12 and Aug. 9, 1924, pages 745 and 299)

The methylene blue solution was placed in several quartz tubes and the ends sealed with sealing wax. Quartz tubes about 3 mm. bore and 5 cm. long were used. One tube (A) was placed outside the window in direct sunlight. A second tube (B) was placed on the inner side of the window on the sash, so that the sunlight fell directly upon it, but passed through the glass.

A third tube (c) was placed on the table in the center of the room with the window raised so that the light from the sky, but not directly from the sun, would fall on the tube. And a fourth tube (D) was attached to a picture frame on the wall so that all light which came to it was reflected or came through window glass. The results are indicated in the following table:—

Table which shows effect of sunlight on methylene blue:

Tube	Time of Exposure
A	1½ hours
Result—Methylene blue bleached out colorless	
B	7 hours (all day)
Result—Methylene blue about half bleached out	
C	4 hours
Result—Methylene blue just about bleached out	
D	7 days
Result—Mythylene blue bleached a little	

From the above table it is apparent that the light waves which bleach methylene blue are numerous in direct sunlight, do not pass through glass very readily. They are, however, present in considerable amounts in the dispersed light of the sky, but not very numerous in reflected light from the walls of the room. From Experiment VII we know that the short light waves which have bactericidal properties are numerous in direct sunlight, do not pass readily through window glass, and are present in considerable amounts in skylight as indicated by their bactericidal power. (See Exp. III.) Hence, we feel that the light waves which bleach methylene blue are those short solar light waves which have bactericidal power.

EXPERIMENT IX

Will This Method Give Information Regarding the Influence of a Smoke Screen Over a City on the Presence of These Solar Short Waves Which Destroy Bacteria?

In order to determine accurately the degree of fading of methylene blue solution, a sample of standard methylene blue was set up in

glass tubes of the same size as our quartz glass tubes. Each tube contained 1 cc. The first tube contained .1 cc. standard methylene blue and .9 cc. water. The second tube contained .2 cc. standard methylene blue and .8 cc. water, etc. The tenth tube contained only standard methylene blue. It was found that the blue in these tubes would soon fade. So that the following method was employed which worked satisfactorily. A fresh set of tubes was prepared and an artist who was skilled in the use of water color paints was employed to reproduce each of these colors in parallel horizontal lines, about one-half inch apart, across a sheet of white paper. The deep blue colored line was numbered 10, the next color 9, etc., to 0 for no color. This sheet of paper with the color scale on it was kept in a book. A strip of the paper about an inch wide was cut across the colored lines above mentioned. This strip was pasted on a board and was used for a color scale until it became faded or soiled, when another strip was cut off and used as indicated. It was a simple matter to compare the color of the methylene blue which had been faded out by sunlight in quartz tubes with this color scale, so that a definite numerical statement could be recorded for each reading.

A quartz tube containing standard methylene blue was placed on top of a high building so that the light from a wide horizon could be obtained. At the same time a similar tube of standard methylene blue was placed out on the porch of a Tuberculosis Sanatorium, twenty-five miles distant. The following table gives the readings at the two places.

Table showing effect of bleaching by the sun on methylene blue in two different localities—one a city under a smoke screen, the other in open:

	City (Elevation 800′ above sea level)					Country (Elevation 1,000′ above sea level)		
Date	Hour	Weather Condition	Reading Methylene Blue Scale	Number of Points Bleached	Hour	Reading on Mythylene Blue Scale	Number of Points Bleached
Jan. 10 to Jan. 12	1 p. m. to 2 p. m.	Hazy Sunshine Snowing	7 6	1	1:10 1:10	7 3	4
May 20 to May 20	8:30 a. m. to 5:00 p. m.	Sunshine Hazy	10 9	1	8:30 a. m. 6:00 p. m.	10 4	6

From the above observations it is clear that the sun's rays at the sanatorium had a greater bleaching effect on methylene blue than it had in the city. Hence, from the above experiments the sun's rays have greater bactericidal effect at the sanatorium than in the city. It is noted that there is much more smoke in the air over the city than at the sanatorium.

LITERATURE

Daylight consists of (a) direct solar radiation; (b) diffuse radiation from the sky; and (c) radiations reflected from surroundings[2]. The nature of radiant energy is in doubt, but many phenomena of light indicate that radiant energy is propagated in the form of wave motion, and waves are transverse to the line of propagation. How the energy is actually propagated is not known.

The sun delivers to 1 square-centimeter of the earth's surface, 1.932 calories per minute all the time. This is equivalent to 1.45 horse power per square yard yer minute. This energy is electromagnetic in character and proceeds through space at the rate of 186,300 miles per second. It is possible to break up a beam of light into it component waves by passing it through a quartz prism. This is known as spectro-analysis. Long waves will be deviated least and short waves will be deviated most from the line of propagation of the beam. Waves which have a length of about 370 millimicrons to 770 millimicrons are visible to the eye. Those of the latter length give to the eye the sensation of red, while those of the former length give the sensation of violet. This group of waves form but a small part of the range of electromagnetic vibration. The shortest known waves are found in radium emanations, and the longest are the Hertz waves, represented by the radio in wireless communication.

In the study of light waves, it was early found that *longer* waves may be found than those which give the sensation of red. They are manifested as heat and are called infra red waves. They are invisible. Again, *shorter* waves than those which give the sensation of violet are found. These are called ultra-violet waves. They are also invisible but are manifest by photographic and biological reactions such as injury to living cells, and modification of growth processes. However, no light waves are effective unless they are absorbed, as pointed out by Grotthus over 100 years ago.

When substances are heated to the extent that they glow, these waves are emitted. Lamps and arc lights are common instruments for the emission of these waves. Arc lights emit rays which are especially rich in short or ultra violet waves. Since our study is confined to the activity of solar light, we must record what facts we can find regarding these radiations, particularly those of short wave length.

The atmosphere which surrounds the earth is perhaps 100 miles thick[1]. Solar light, rich in short waves reacts with the oxygen of the atmosphere, making a shell of ozone around the earth. This shell of ozone, and free oxygen absorbs the shortest solar waves. When the remaining solar radiations reach within a few miles of the earth's surface, another shell of water vapor is encountered, which further absorbs the short solar radiations. Near to the earth, varying amounts of oxygen, dust, smoke, pollen, ammonia, are present as sea level is approached. These materials still further remove the short waves from the solar radiations, so that the radiations of the solar spectrum stop very sharply, at about 290 millimicrons. Other important factors are the latitude, elevation, and time of day. The following tables by Cornu, reported by Luckiesh, indicates the lower limit of the solar spectrum at various altitudes of the sun (time of day.)

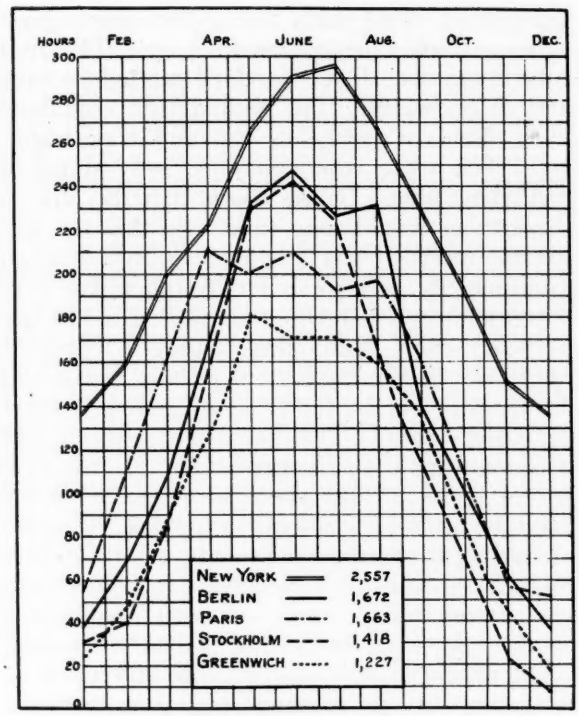
Time of day Hours	Minutes	Wave length lower limit in millimicrons
10	30	295.5
12	02	295
1	18	295.5
1	50	297
3	09	299
3	40	304.5
4	17	304.5
4	38	307

It is thus apparent that the shortest waves of the raditions are decreased by increase in air mass. Water vapor absorbs waves of about 175 millimicrons in length. Oxygen absorbs waves of about 186 millimicrons in length, as the temperature of the oxygen rises, this absorption band widens. The ozone in the atmosphere is equal to about 3 millimeters in thickness at atmospheric pressure. A layer of ozone 25/1000 millimeter in thickness at atmospheric pressure will absorb half the radiations of 225 millimicrons in length, so that ozone together with fog, dust, and smoke, permits but few solar waves shorter than 300 millimicrons to reach the surface of the earth.

The duration of sunshine at various latitudes is of interest.

Latitude degrees	Dec. 22 Hours	Minutes	June 21 Hours	Minutes
0	12	7	12	7
10	11	32	12	43
20	10	35	13	20
30	10	13	14	05
40	9	19	15	01
50	8	04	16	23
60	5	52	18	52
65	3	34	22	03

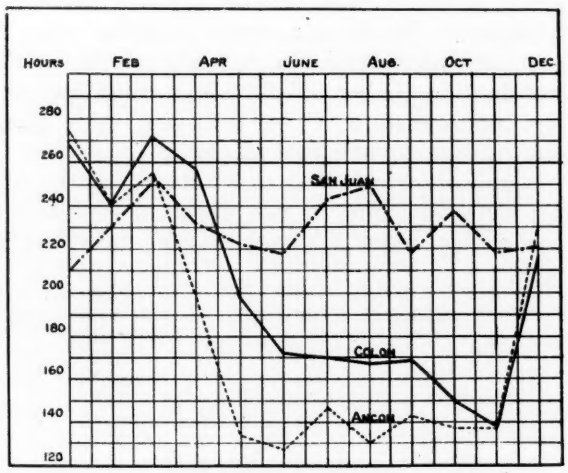
Dr. Alfred Hess has recently published[3] a chart which shows the number of hours of sunshine by months in five large cities of the north temperate zone, as follows:



AMOUNT OF ACTUAL SUNSHINE (YEARLY AVERAGE) IN FIVE CITIES IN THE TEMPERATE ZONE

Hess-Jour. A.M.A.-Apr. 4, 1925

He also presents a table which shows the number of hours of sunshine which appear monthly in three tropical cities.



AMOUNT OF ACTUAL SUNSHINE YEARLY IN SOME CITIES OF THE TROPICS AND WEST INDIES.

ANCON ---- 2,154
COLON — 2,413
ST. JUAN—·— 2,120

Hess-Jour. A.M.A.-Apr. 4, 1925

The point to these two charts is that while the total number of hours sunshine in two different places may be nearly the same, the effect of the sun's rays may be different, presumably depending upon the kind of rays which may be present. Dr. Hess feels that light wave lengths of 302 to 313 millimicrons in length reduces the presence of rickets among young children. In New York there is considerable rickets. In the tropical cities above mentioned

there is no rickets, apparently due to a richer amount of these short solar wave lengths in the sunlight of tropical cities.

The short waves are present in sunlight during the hours of 9 to 3 in the summer, and 11 to 1 in the winter. The short waves are most evenly distributed through the seasons at high altitudes.

The distribution of radiant energy from the sun and sky is of interest. Langley[4] estimated that of the solar radiations reaching the earth, 60 per cent was infra red and the remaining 40 per cent were visible and ultra violet radiations. The molecules of dry air scatter radiations of short wave length. At sea level the sky furnishes 32 per cent as much radiation as the direct high sun. At elevations of 6,000 feet the sky furnishes only 7.2 per cent as much. The intensity of short waves in diffuse light is variable on account of reflections from surroundings (snow good reflector of these waves), suspended foreign particles, and water vapor. These large particles relative to the size of molecules reflect short light waves, and tend rather to diminish the proportion of short waves[5]. Fabry and Buisson by special spectroscopic methods[6], obtained a photograph of the solar spectrum by exposure to the sun for 75 minutes. This photograph registered a wave 289.84 millimicrons in length. This was obtained about noon, June 7, 1920. The intensity of this wave is about one millionth that of a wave 315 millimicrons in the same spectrum. In diffuse sky light at sea level one would expect these short waves to be practically eliminated by the coarse dust and smoke particles which are found in the lower atmosphere.

Window glass also absorbs these short light waves, depending upon thickness and the chemical composition. According to photographic meaurements and biological tests ordinary glass does not permit light waves shorter than 300 milimicrons to pass through. Light waves at 350 milimicrons begin to diminish in amount in passing through ordinary window glass[2]. The amount of shorter waves which pass through rapidly decreases until at 300 millimicrons practically none pass as determined by photographic methods. However, in the course of time a perceptible amount of shorter waves do pass through. These short waves will pass through quartz glass almost without opposition. Hence, the necessity for using quartz glass in the optical parts of spectroscopes. It is impractical at present from a manufacturing and commercial point of view to make glass for windows which is transparent for these short waves.

The lethal effect of light waves is confined to the ultra violet. To be sure, heat waves may destroy life, but as it is usually represented in solar radiation no lethal effect occurs except when the short light waves are present, as demonstrated by Downes and Blunt, nearly 50 years ago. Bernard and Morgan[8], 1903, using various arc lamps with terminals of iron and cadminum, or aluminum or carbon with eleven amperes current, with light passing through .5 mm. slit in the spectroscope, found the spectrum killed cultures at wave lengths 328.7 to 226.5 millimicrons in periods of 15 to 45 minutes. Cultures of B. coli, B. substilis, M. tetragenous, S. aureus, and B. tuberculosis, were used.

Browning and Russ[9] repeated these experiments, using a tungsten arc, and added B. typhosus and meningococcus, with practically the same results except that the longest effective wave was 296.0 millimicrons. Bayne-Jones and Van der Lingen[10] by the use of glass filters, claim sunlight kills staphylococcus aureus by the use of wave lengths up to 360 millimicrons. If this were true there should be killing of these organisms in the late afternoon when these waves are still abundant. In our experience no bactericidal effect by sunlight is evident at this time of day. Hertel[11] experimenting with fertilized cells found that the injury to the cells, and the retarded development due to the wave lengths of 280 millimicrons was dependent upon the intensity of the radiation. Using direct sunlight, injury was marked, but by using diffuse daylight the cells were not injured unless they had been sensitized with a florescent substance.

Rosenau[12] reviewed the literature on the viability of tubercle bacilli, and showed that direct sun rays would kill them in a few hours.

Tappiner and Jodlbauer[13] showed that when living organisms were suspended in dilute solutions of florescent substance ,and then were exposed to certain long light waves, injurious effects would be noted. How far this principle prevails in nature needs further investigation.

How do these short radiations of light kill bacteria? The answer to this question involves several other questions. What is light? Of what are bacteria and other living cells composed? How are their constituent parts put together? While information on these questions is not complete, there is an interesting array of observations which permit glimpses into these most interesting fields of research. A review of this field cannot adequately be presented in a summary of this kind. Suffice it to say that it is conceived[14] that the rate of rythm of these light waves may synchronize with the vibrations of certain molecules which compose the bodies of bacteria or other living cells, and by so doing neutralize the vibration of the molecule in the cell. In other instances

they may increase the amplitude of the vibrating molecule so that it goes out of relation to the other molecules of the cell. Too great an interference with the molecules of a cell may damage the functional activity of the cell.

Many physicists state this phenomena in terms of electronic activity. Light energy absorbed by a body may increase molecular motion. If the incident light has a small enough wave length to produce oscilations of the electrons rather than in the molecules or atoms, the absorption of light may result in the escape of electrons from the atoms, causing a change in valency, and thereby a chemical reaction.

Janet Clark[15] showed that egg albumen would coagulate under the influence of ultra violet light when the egg albumen was held in solution at a greater hydrogen ion concentration than 4.8—its isoelectric point. The absorption of light having a wave length around 300 millimicrons causes an emission of electrons. Some of the particles would lose their negative charge while others would acquire a positive charge. The particles having a positive charge would unite with those having a negative charge and coagulation results.

Coagulation or floculation is observed in large uncellular organisms as an initial injury in lethal doses of ultra violet light.

The above outline indicates briefly the theoretical explanation for the death of bacteria due to sunlight. Details of these interesting conceptions must be acquired from monographs, such as those of Andrade[16] and Perrin[17].

SUMMARY

An experiment is presented which shows that in a certain latitude, elevation, season of the year, and middle of the day, sunlight will kill staphylococcus aureus in one hour.

Again, an experiment is presented which shows that sunlight under the conditions above mentioned, and after passing through plate glass 8 mm. thick, will kill staphylococcus aureus in 4½ hours.

Another experiment shows that indirect sunlight such as skylight from a northern exposure under the conditions of the first experiment will kill staphylococcus in about four hours.

An experiment is presented which shows that sunlight under the conditions of Experiment I during the latter part of March will become effective in killing staphylococcus aureus at about 9 o'clock in the morning, but has very little effect after 3 o'clock in the afternoon.

An experiment is given which shows that when an iron arc of a certain size is used as a source of light, if this light is passed through a spectroscope, and the spectrum is spread on the surface of a bacteriall culture, bactericidal effect will be first noted in that part of the spectrum which is composed of wave lengths between 2300 and 2850 Angstrom units. On longer exposure longer wave lengths are noted to be effective. No longer wave length than 3100 Angstrom units was observed to be effective even after five hours' exposure.

An experiment is presented which shows that at noon of April 1st at the above mentioned elevation and place, the shortest solar wase length observed was 2995 Angstrom units. At 7 o'clock in the evening the shortest wave length ovserved was 310 Angstrom units. Since bactericidal properties of sunlight for staphylococcus aureus were not apparent after 3:30 p. m. it would appear that the effective rays in sunlight must be confined to those wave lengths which are apparent at noon, but not apparent in the late afternoon. These waves are between 2900 and 3100 angstrom units in length.

An experiment is presented which indicates that methylene blue in acetone is bleached by the solar rays which have bactericidal activity.

CONCLUSION

What do the above experiments mean to the health officer? The health officer may, with confidence, rely on sunlight, and sky light to destroy bacteria if exposed to it for two hours during the middle of the day.

With-drawing the draperies and raising the shades, even if the windows are closed, if the sun light and sky shine can enter, the destruction of bacteria will gradually be brought about.

By means of the bleaching of acetone methylene blue, the health officer may easily determine the most active periods of the day in each season of the year when the sun and sky shine may be most useful. These periods will vary with the altitude, latitude, season of the year and condition of the atmosphere. The period of the day when sunlight has bactericidal power is shorter in winter and longer in summer.

Washing the woodwork or parts of furniture likely to have become contaminated will break up covering matter which conceal bacteria, so that the sun light may become more effective.

Open books, feathers, draperies, rugs, cushions may be amply disinfected by placing out in direct sun light for two to four hours during the middle of the day. They must be so placed that the sun can have free access to their surfaces.

Health officers should interest themselves in preventing a smoke screen to come over their community. A smoke screen will deprive that community of the solar rays which destroy harmful bacteria. A smoke screen will also deprive a community of these solar rays which

stimulate nutrition in young childhood. A smokeless town will have less rickets.

Bacteria live a long time in dark rooms, hallways, and basements when they are damp. The sun can have no effect on bacteria in these places. Hence the importance of building supervision, so that buildings shall not be erected which are not adequately lighted by sunlight. Store basements cannot rely on incandescent lamps to disinfect the air and woodwork, except only as drying is useful.

The association of fluorescent substances to assist the longer light waves in the destruction of bacteria needs further research. The lethal effect of drying as produced by the infra-red waves is recognized as an important means of destroying bacteria.

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SOME RESIDUA OF EPIDEMIC ENCEPHALITIS

W. H. MARSHALL, M. D, and
M. S. CHAMBERS, M. D.
FLINT. MICH.

No more interesting problem has confronted the physician in recent years than the recognition of epidemic encephalitis and its residua. In fact, encephalitis has established its claim to recognition as a separate disease chiefly by the character of its late manifestations. These residua are seen so frequently that undoubtedly we have recognized but a small percentage of the cases of acute encephalitis. This does not necessarily reflect on the diagnostic ability of our profession, for the several epidemics have varied so much in symptomatology that some confusion was inevitable. Sometimes a physician was not consulted until residua appeared.

This topic has not been an unfamiliar one in medical literature, even before the flood of contributions during the past ten years. The lethargic phase was described in the Tubingen Schlafsucht of 1712 and the myoclonic phase by Dubini in his description of an epidemic of "Electric Chorea" in 1846. Various epidemics have been recorded, the most extensive being the present one, which, starting in Vienna in 1916, spread to France and England, and reached America in 1918. It appears to have continued with periodic exacerbations ever since. It is remarkable that the outlying districts of the state have furnished us as many cases as the more densely populated centers, an observation which can be paralleled in our experience with poliomyelitis.

While much laboratory and experimental work has been done, we feel that much more evidence must be presented before we can say that the etiology of the disease is definitely establishd. Is it due to a filtrable virus or to the streptococcus described by Rosenow? Has it any relationship to influenza or to herpes febrilis? What is the incubation period and how is it transmitted? To all of these questions we must reply that we do not know.

The essential pathological process in the acute phase, is a perivasculuar infiltration chiefly affecting the minute vessels of the midbrain and basal ganglia. This is followed by focal necroses of various sizes, and while there is some degeneration of nerve cells, the brunt of the inflammatory process falls on the interstital tissues and vessel walls. The resulting fibrosis is not soon limited, but may continue for months or years, thus interfering with nerve paths. In the chronic phase, there is hyaline degeneration of the vessel walls, followed by calcareous degeneration, not only of the

walls, but of the thrombi and minute clots. Flakes of calcium may also be seen around degenerated ganglion cells in circumscribed areas in the midbrain and basal ganglia. As any part of this important, but little understood area of the brain may be affected, it is not surprising that there should be such variability in the symptoms, signs, and residua of the disease. In fact, it would seem that the many careful clinical and pathological studies now being carried on, may eventually give us much information about the physiology of this area.

THE PARKINSONIAN SYNDROME

In 40 per cent of the cases which we have considered post-encephalitic, the clinical picture was that of the Parkinsonian syndrome. This term was adopted by the French school because of the resemblance of the symptoms to those of presenile paralysis agitans. Our patients were chiefly young adults and the symptoms were recognized after a period of 6 to 30 months normalcy. Hall of Sheffield[1] has emphasized the points of resemblance and difference between this syndrome and paralysis agitans. Parkinson originally described three primary symptoms—tremor, rigidity, and loss of associated and automatic movements. This syndrome is frequently *something less* than paralysis agitans. For example, the tremor may be less manifest and is usually coarser than in paralysis agitans. The distribution may be less generalized and we have seen cases where only one arm was rigid. In two instances, facial stiffness was unilateral. It is frequently *something more* than paralysis agitans. In one of our cases there was an increased knee jerk and an extensor response. Rigid or unequal pupils may be seen. One of our patients had a facial tic. There would seem to be more mental depression and in some instances we have noted definite mental deterioration. Its *mode of onset and progress differs* from paralysis agitans. Occurring in younger people, it progresses more rapidly than does paralysis agitans. The immobile facies occurs much earlier. Some patients have trouble in masticating and in properly protruding the tongue. Many of them drool saliva freely because the muscles of the mouth and face are so stiff that saliva cannot be readily swallowed. There is no difference in the attitude and gait. The differential diagnosis usually gives little trouble. However, Dr. J. Garvey, of Ann Arbor, in a personal communication, reports a patient with this syndrome who had been operated upon for exophthalmic goiter. He states that the basal metabolic rate is increased in all of these Parkinsonian cases.

EXCITO-MOTOR RESIDUA

Many excito-motor phenomena may be observed after encephalitis. Spasmodic tics are rather common. One of our patients who had a prolonged attack in 1922 has recovered completely with the exception of a rhythmic tic of the right forefinger. We have seen patients with facial tic and one who made clicking noises with his tongue for several weeks, after the acute attack. We report a case illustrating a myoclonic group.

"Miss G. K. aged 18 had an attack of encephalitis in 1922. Myoclonic features were present during this illness which lasted three weeks. She made a good recovery, but gained 50 pounds in weight during the next year. In 1924 she had a "nervous breakdown" characterized by headache, tremor, and "nervousness." After recovery, she again gained in weight. In July 1925, she had another relapse of a similar character. She entered Hurley Hospital on Jan. 31, 1926 complaining of headache, drowsiness, and muscular twitching. Her weight was 190; basel metabolic rate, minus 20; blood sugar, 68 mgm.; radiogram of sella normal. She had a respiratory tic, occuring about every two minutes, when she would suddenly hold her breath and the accessory muscles of respiration would go into spasm. She had involuntary, shocklike, clonic contractions of the left biceps, pectorals and deltoid. The amplitude was variable and the rhythm rather disorderly, although at times it became regular at a rate of about eight contractions a minute. The movements were aggravated by exertion and by attempts at volitional control, but they ceased during sleep. There was moderate rigidity of these muscles."

The possibility of hysteria was considered but no stigma of functional disease could be elicited. The contractions resembled those of paramyclonus multiplex, but differed in being unilateral. The late appearance of the residua, as well as two definite relapses, would suggest that the virus of this disease continues to live and to do harm for a long period after the onset. Ramsey Hunt explains the myoclonic phenomena as being due to irritative lesions of the striatal mechanism[2].

RESIDUAL PARALYSES

Residual paralyses are not as common as might be expected from a disease affecting the central nervous system so extensively. One frequently sees pupils that are unequal and that react badly or not at all to light and accommodation. We have only seen one instance of hemiplegia.

"Mrs. G., a housekeeper of 32, was seen in June 1923, with an acute throat infection. On the third day she had a diplopia and was somewhat delirious. On the fourth day she sank into coma. The blood pressure was 110/75 and there were no evidences of arterial degeneration. The urine was not abnormal. The Wasserman test was negative. The cerebro-spinal fluid was under pressure, had 30 cells, chiefly lymphocytes and gave a normal glucose reaction. She regained consciousness about the seventh day when it was noted that she had a motor aphasia and paralysis of the right arm and leg. These cleared up rapidly and at the end of 10 days she talked well and used her

limbs. At the end of a month she was apparently well, except that she had a typical swinging hemiplegic gait, with exaggerated tendon reflexes on the right side."

PROGRESSIVE INVOLVEMENT OF THE PYRAMIDAL SYSTEM

The following case shows the tendency of the disease to progress and seems to be an instance of a very rare type of residua.

"Mr. C. L. M., a mechanic of 55, was treated by one of us during a severe attack of encephalitis which commenced on Nov. 22, 1919 and which lasted about six weeks. The chief features at this time were headache, diplopia, delirium. and stupor. After the acute attack, he still complained of headache and depression. He consulted Dr. Sheldon of the Mayo Clinic, who considered his condition due to encephalitis, but reported the neurological examination negative except for a slight inco-ordination of the left hand and a coarse tremor of the tongue and head. During the summer of 1920, his leg and arm muscles gradually became spastic, the deep reflexes increased and the plantar responses became extensor. There was no tremor except of the head. This condition gradually became worse until he was confined to bed with a spastic diplegia and became unable to feed himself. In the summer of 1921, his speech became indistinct, and after speaking a few words would be entirely lost. He drooled saliva and had difficulty in swallowing. He complained of pains in his tongue, but no atrophy was apparent. Sensation was normal and the only atrophy was that of disuse. He became much emaciated an died in a paroxysm of dysphea in October 1922. An autopsy could not be obtained."

It would appear that both pyramidal tracts had been involved in the region of the posterior part of the lenticular nucleus, thus producing a spastic paralysis and a pseudo-bulbar paralysis.

EPILEPSY

In two instances we have observed epilepsy following encephalitis. In both, the onset was abrupt with violent headache and convulsions. In both, metabolism was well marked before the seizures were noted. The modern concept that the fit is due to a temporary withdrawal of the cortical inhibitive functions, leaving the lower motor mechanism uncontrolled, opens up an interesting field for speculation. It may be possible that pathological changes involving nerve fibres in their course from the cortex to the mid-brain may be responsible for a temporary descerebration. The case selected is of interest, not only because of the epilepsy, but also because of the obesity.

"Miss G. W. a student of 15, was seen on June 25, 1925 because of "fits." She had an illness diagnosed as influenza in March 1923. At this time she was delirious and had one convulsion, followed by myoclonic movements lasting for a week. At this time her weight was 110 pounds. During convalescence she was apathetic during the day and restless at night. In six months her weight had increased to 160 pounds. In Jan. 1924, she began to have attacks of petit mal and in May 1924 she had her first attack of grand mal. At the time of our examination, she was having eight to ten attacks of petit mal daily and averaged two attacks of grand mal each week. Her weight was then 180, the fat being chiefly on the neck trunk and thighs. She also complained of transient attacks of polyuria. The neurological examination elicited no abnormal findings."

DISTURBANCES OF SLEEP

In the acute phase of encephalitis, sleep disturbances have been prominent, our first cases having been definitely lethargic. We have seen convalescents from encephalitis who for months were excitable and restless at night and so sleepy during the daytime that they were unable to carry on their usual occupations.

Mrs. B., a housewife of 30, was seen on Aug. 7, 1926 complaining of insomnia and pains in the neck. In April 1926, she was ill for a week with what was diagnosed influenza, during which time she was febrile, had severe headache, diplopia, delirium, and insomnia. Ever since this illness, she becomes agitated in the evening, is constantly active and talkative throughout the night, and falls asleep in the early morning. On examination, she is found to have a coarse tremor, and her pupils do not react. Apart from this her physical, neurological and laboratory examinations reveal nothing of importance."

We believe that these symptoms and signs are sufficient to make a retrospective diagnosis of encephalitis.

RESPIRATORY DISORDERS

Not only may various respiratory phenomena be noted in the acute stage, but they may also be observed as after effects. A spasmodic nonproductive cough and a tendency to hiccup are not uncommon. One of our patients had for several weeks, a spasmodic tic-like contraction of the diaphragm and accessory muscles. Disorders of the rate and rhythm are frequently reported. We have seen one remarkable instance of paroysmal polypnea.

"M. B., a boy of 6, was brought by his mother to clinic on July 11, 1926 because of changes in disposition and spells of rapid breathing. In 1922, he had afebrile disturbance during which he was stuporous. During the next year, he showed some facial tics and was very restless. In 1924, he began to have attacks of polypnea, followed by brief periods of apnea. This condition has so progressed that he has them about half the time. The aggravated by excitement and activity and they are not controlled by attracting his attention. At present, an attack will last for a minute or two, at a rate of 60 to 70, followed by a period of apnea. The respirations are very shallow. Respiration is normal during sleep. No Chovstek or Trousseau signs can be elicited and there is no carpopedal spasm or other sign of tetany. He is quite unmanageable and is cruel to animals and playmates. Further examination revealed nothing of importance."

The explanation of this condition is not at all clear. It has been suggested that thalamic lesions may produce disordered respiratory rhythm. A very similar case has been reported by Barker and Sprunt except that the patient had manifest signs of tetany due to disturbance of the acid base equilibrium by excessive oxidation[3]. We have examined this patient re-

peatedly, and we are surprised that he does not show these phenomena. Smith has recently reported four cases with disturbed respiratory rhythm, one of persistent tachypnea and three of paroxsmal polypnea[4].

DIABETES INSIPIDUS

There is much evidence accumulating to show that lesions of the pituitary gland are not constant in diabetes insipidus. Aschner believes that this disease is due to disturbance of the function of the diencephalon[5]. Puncture of the tuber cinereum just posterior to the infundibulum will produce polyuria. Focal softening of this area from encephalitis could explain this syndrome.

"H. W., a laborer of 19 years, was seen in Nov. 1923, complaining of polyuria and weakness. He had an attack of encephalitis in October 1922 from which he made a good recovery except for persistent headaches. In April 1923, he manifested a gradually progressive polydipsia and polyuria. When first examined by us, he was passing 400 ounces or urine daily, with a S. G. of 1002. There were no abnormal findings noted in the fundi, visual fields, or in the radiogram of the sella turcica. Neurological examination was quite negative. Pituitrin hypodermically failed to control the output."

METABOLIC DISTURBANCES

In several instances we have observed a pathological gain in weight, but in only one case was it extreme. In addition to the obesity diabetes mellitus supervened as well as definite changes in personality.

"R. B. D. a mechanic of 27, was treated by one of us during a severe attack of lethargic encephalitis in September 1920. At that time his weight was 175, but six months later he weighed 269. A part from a little drowsiness, he felt well and was at work. In January 1922 he complained of polvuria and polydipsia and it was found that he had diabetes mellitus. He could be rendered sugar free on a diet of about 1500 calories, but he would not co-operate well and would not adhere to his diet. For his later history I am indebted to Dr. J. T. Connel. His weight increased and the glycosuria returned. He changed from a steady workman to an irresponsible one. He spent much time in gambling recklessly and the last report obtained of him dealt with his arrest in an eastern city for forgery."

Aschner, in endeavoring to separate the functions of the pituitary gland from those of the diancephalon, demonstrated that stimulation of the diencephalon, chiefly in the hypothalamic area, could produce polyuria, glycosuria and dysplasia adiposo-genitalis. He believes that there is a sympathetic nerve connection between the mid brain, pancreas, and liver.

PROGNOSIS

About 50 per cent of all cases of epidemic encephalitis will have residua. Years of observation will be necessary to appreciate the course and seriousness of the after effects. The outlook would not seem to be hopeful for periods of improvement may be followed by exacerbations of the disease. Our impression is that Parkinsonian cases remain stationary or get worse, while myoclonic forms tend to improve.

TREATMENT

Treatment is discouraging and no reliable specific therapeutic measures have been established. I have seen no improvement after the use of various arsenicals. In the management of the Parkinsonian syndrome, scopolamine hydrobromide, gr. 1/150 increases to gr. 1/50 three times a day is of great value in controlling the tremor. This had the advantage of making the patient less self-conscious of his disability. Patients showing mental and character changes do better in institutions. Bromides and Luminal have been found beneficial in the epileptic residua. Exercises and passive movements are of some value in relieving muscle spasm.

CONCLUSIONS

1. Epidemic encephalitis has been more prevalent in Michigan than statistics would appear to show.
2. The disease has not been limited to cities but has also affected the rural population.
3. Some cases are progressive from the onset.
4. Residua may make their appearance after an interval of apparent good health.
5. In some instances, a retrospective diagnosis is all that is possible.
6. Many types of residua may be seen, depending upon the part of the central nervous system that may be affected.
7. The prognosis as regards residua is uncertain.

DISCUSSION

Dr. William H. Riley (Battle Creek): Mr. Chairman, I have enjoyed Dr. Marshall's paper very much. I think he has brought to us a very important subject. I think it is well established that encephalitis is on the increase rather than on the decrease. The sequelae that we see presented to us are some of the most important and frequent organic lesions of the nervous system. For instance, the Parkinsonian form that the doctor has spoken of is quite as frequent as is the paralysis agitans form or as frequent as tabes. It is a very frequent organic disease of the nervous system and one that is not always recognized.

This disease brings us to a very important problem, in fact since our numerous epidemics of influenza and our World War we have brought to us many new problems in the field of internal medicine and neurology and psychiatry and among these are these sequelae of encephalitis. We do not always get a history in these cases of an acute illness and for that reason the diagnosis becomes more difficult. I have seen quite a few cases where you get no symptoms of fever, no symptoms of any palsy, no symptoms of effulgy or somnolence, where the disease develops without acute symptoms. Because of that the diagnosis is more difficult. Right here I would like to emphasize

the importance of the history when you can get a regular history in the diagnosis of these sequelae. The history often helps us out very much; sometimes it does not.

The most important sequela, I think, at least in my experience, of encephalitis is the Parkinsonian syndrome, and it is well for us to keep in mind that this comes very often, perhaps most frequently in young subjects, in early adult life, while the paralysis agitans, as you all know, usually comes later in life. That may help us some in our diagnoses.

Then the history, as I have already stated, of the development of the Parkinsonian form of encephalitis is quite different than the history of the ordinary paralysis agitans. It develops more rapidly as a rule.

Another point that has impressed me very much is the interval between the acute symptoms and the appearance of the symptoms of Parkinsonian syndrome. Very often it is weeks or months. I have seen cases develop three years later, cases of the Parkinsonian syndrome develop three years after the acute symptoms. Right here I would like to emphasize the fact that these cases usually give a history of having had influenza. Whether it is influenza or the acute stage of encephalitis it is not always easy to say. But in nearly all cases you will get a history of influenza and then a period of weeks or months or a year or two or three years before the sequelae appear. So very often the patient and sometimes the physician doesn't connect those two together.

Dr. Marshall has spoken of the pathological changes in the basal ganglia and brain stem. Now right in this connection while I am speaking of this interval, I wish to say my idea is that it is not an cessation of the disease in this interval, but rather a remission, that is, the disease is progressive right along but there is a period, sometimes a long period of remission between the acute symptoms and the sequelae. But I really think that the disease is there all the time but progressing very mildly over that period.

Dr. Marshall has spoken of the difference in the tremor in the Parkinsonian form. My experience is that the tremor in the encephalitis cases is usually more an intentional tremor, while in the other forms it is more a passive tremor. There are a great many other forms of this diseaes. I saw one lady who gained 100 pounds in weight in six months. Another case, a young girl, gained 50 pounds in three months.

Chairman Sladen: I think some one should praise Dr. Marshall for this paper more than this silent praise that he is being given. It is a splendid thing, it seems to me, for us as internists not to be gun-shy of neurology, Dr. Riley is a neurologist; Dr. Marshall is an internist. I believe we should also keep our finger on neurology. I think that has been one useful thing in syphilis syndromes that we are constantly drawn into neurological problems. There is one tendency in it, that is with the prevalence of post-encephalitis syndromes, anything that is bizarre is very likely to be diagnosed as post encephalitis syndrome.

Dr. Riley touched on a question I wanted to ask, that is as to the chronicity of the condition, whether or not he felt cases dealing with constantly chronic progressive conditions or cases with remissions, as Dr. Riley stated, were really sequelae and the infections over with.

Does any one else wish to discuss this paper?

Dr. W. H. Marshall: I believe that some cases are progressive from the onset. I believe that other cases have remissions, and later may have exacerbation. I think it will take many years of observation before we will say the last word on what is to happen to these patients.

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A COMPARATIVE STUDY OF PREGNANCY AND LABOR IN PRIMIPARAE IN RELATION TO AGE*

LAWRENCE E. MC CAFFREY, M. D., C. M.
ANN ARBOR, MICH.

The following study is based upon 500 consecutive primiparae admitted to and delivered in the obstetrical division of the Department of Obstetrics and Gynecology of the University Hospital.

AGE

The cases have been divided into two groups, according to age. The first group includes patients of 16 years and under; the second group those over 16 years. In the first group there were 103; in the second 397. The average age of all patients was 19.9 years. The oldest patient was 42; the youngest 13. There were two patients of 13, seven of 14, and seventeen of 15 years of age.

PELVIS

All pelves were carefully measured, either on admission or where the patient entered the hospital in labor, sometime before discharge.

Table No. I—Pelves

	Group 1		Group 2	
	Total	Per Cent	Total	Per Cent
Funnel	8	7.4	34	8.5
Flat	3	2.9	10	2.6
Gen. cont.	3	2.9	12	3

There were in all 42 cases (8.4 per cent) where the pelvis was considered of the funnel type. A biischial diameter of 7.5 was considered the low limit of normal. This type of pelvis was found to occur slightly more than 1 per cent more frequently in the second group and was by far the most common type of pelvic contraction.

There was a total of 13 cases (2.6 per cent) where the pelvis was of the simple flat variety. The condition was present slightly more frequently in the first group, but the difference can be considered as negligible.

The total number of cases generally contracted pelves was 15 (3 per cent). The percentage of these cases corresponded very closely in the two groups.

* From the Department of Obstetrics and Gynecology, University of Michigan, Ann Arbor, Michigan.

Table No. II—Complications of Pregnancy

	Group 1 Total	Group 1 Per Cent	Group 2 Total	Group 2 Per Cent
Preeclamptic Toxemia	7	6.8	12	3
Nephritic Toxemia	0	0	5	1.3
Eclampsia	1	1.0	5	1.3
Gonorrhea	2	2.0	25	6.3
Syphilis	6	5.8	35	9.0

Preeclamptic toxemia was present more than twice as often in the younger group. Not one case of nephritic toxemia was found in Group 1, but it occurred in 1.3 per cent of the cases in Group 2. Eclampsia was found to be present slightly more often in the second group. Gonorrhea was more than three times as frequent a complication of pregnancy in the second group as in the first, while syphilis was present one and a half times more often.

Table III—Position

	Group 1 Percentage	Group 2 Percentage
Lest-sided	61	62.5
Right-sided	36	34
Breech	3	3.5

Positions were divided into left-sided, right-sided and breech. The positions were found to be practically identical in the two groups. There was but one face posteriorly and necessitated craniotomy after the death of the fetus in order to bring about delivery.

Table IV—Labor

	Group 1 Total	Group 1 Per Cent	Group 2 Total	Group 2 Per Cent
First degree laceration	25	24.2	50	12.6
Second degree laceration	7	6.8	65	16.5
Third degree laceration	0	0	3	.75
Episiotomy	13	12.6	50	12.6
Low Forceps	6	5.8	25	6.3
Mid Forceps	0	0	5	1.3
Extraction	2	2	8	2
Version	0	0	1	.3
Cesarean	0	0	6	1.5

In the study of labor and its complications it is seen that first degree lacerations occurred twice as frequently in the younger group, while second degree lacerations were nearly three times as frequent in the older patients, the total percentage of lacerations being nearly equal in the two groups. Third degree lacerations did not occur at all in Group 1, while there were three in the second group. In two of these there was no contraction of the pelvis. Repair of the sphincter ani and perineum was done immediately after labor was completed and all three healed nicely. Delivery by low forceps was necessary .5 per cent more often in Group 2. Medium forceps delivery was not required in the first group and was done on 1.3 per cent of the second. Extraction in breech cases was performed in 2 per cent of each group. Only one version was indicated and this fell in the second group. Six Caesarean sections were done, all cases being in the older group. Two of these operations were done because of the outlet, the transverse diameter being six centimeters in each case with the baby's size estimated as being normal or slightly larger.

DURATION OF LABOR

The duration of labor was found to be less than is quoted in most text books, the usual length of labor in primiparae being regarded as about eighteen hours. In the first group 11.6 hours was found to be the average length of labor and 13.9 hours in the second. The younger patients required 2.3 hours less for completion of labor. Over 85 per cent of the cases were patients in the Maternity Cottage before labor set in and therefore these figures can be considered as accurate as is possible.

Table V—Child

	Group 1 Total	Group 1 Per Cent	Group 2 Total	Group 2 Per Cent
Syphilis	5	4.9	25	6.3
Cephalhematoma	2	1.9	3	1
Stillbirth	2	1.9	10	2.5

As would be expected from the number of cases of maternal syphilis, a larger proportion of children in the second group were treated. Most of these cases had no definite symptoms or findings of the disease. Cephalhematomata were seen twice as frequently in Group 1 as in Group 2, but the number in both groups was very small. Stillbirths occurred .6 per cent more frequently in Group 2.

MORBIDITY

Morbidity is determined by a fever of 100 degrees or more on two successive days during the puerperium. In the first group there were 10 cases (9.0 per cent) of morbidity, while it occurred 40 times (10 per cent) in the second.

MORTALITY

There were three maternal deaths in the series (.6 per cent). In the first group there was one death from eclampsia, while in the second, one died of eclampsia and one of sepsis.

CONCLUSIONS

(1) Normal and contracted pelves were found to correspond fairly closely in the two groups. The remarkable feature of the study of these pelves was that not one case of rhachitic type of flat pelvis was discovered. Funnel pelvis is by far the most common type of contraction in this section of the country.

(2) Preeclamptic toxemia was present more than twice as often and nephritic toxemia not at all in the younger primiparae. This seems to demonstrate that the whole organism in the younger women is less fitted to withstand the extra strain of pregnancy. It is rather difficult to explain the absence of nephritic toxemia in this group.

(3) The more frequent occurrence of venereal diseases among the older group can be explained on the basis of exposure. Many

of the younger primiparae give a history of pregnancy after one or very few exposures.

(4) Age does not seem to have any appreciable effect upon the position of the fetus in utero.

(5) The total number of lacerations of the perineum was the same. However, the deeper type of tears were much more frequent in the older group, while the tissues are more elastic in the younger women.

(6) The duration of labor was shorter in the younger patients by more than two hours and shorter in the whole series than is usually believed.

(7) The morbidity rate was the same in both groups.

(8) The death rate was practically the same in the two groups.

(9) Youth has no appreciable effect upon pregnancy and its sequalae, except that it makes the outcome a little less strenuous.

THE USE OF A MIXED VACCINE IN THE TREATMENT OF PERTUSSIS

EDWIN P. RUSSELL, M. D.
BATTLE CREEK, MICH.

It is evident that the use of vaccine in the treatment of whooping cough has fallen into disrepute during the past few years. Many practitioners refuse to use it claiming that it is of little or no value, and some of the standard textbooks on Pediatrics state that it is of value only as a prophylactic measure. Friedelander in Abt's Pediatrics states that the vaccine should be freshly prepared to be of value as a therapeutic agent and it is difficult, if not impossible, for a man in private practice to secure a fresh preparation for each case when needed.

During the past spring and summer there has been a widespread epidemic in Battle Creek and many patients presented themselves at the Battle Creek Sanitarium Dispensary for treatment and for prophylactic injection. At first an uncombined stock vaccine containing 4,000 million Bordet and Gengou bacilli per c.c. was used. This vaccine gave good results as a prophylactic, but was of doubtful value as a therapeutic agent. A combined vaccine containing 4,000 million Bordet and Gengou bacilli; 500 million staphylococcus aureaus; 100 million streptococci, hemolytic and non-hemolytic; 200 million pneumococci; and 160 million Pfeifier's bacilli was then tried with more striking results as will be shown.

The cases herein cited are only those in which a definite diagnosis of pertussis was made.

It was surprising to find that the leucocyte count was not of diagnostic value. This was contrary to teaching and previous experience, but the conclusion was forced upon us by several unfortunate experiences. Four patients, early in the epidemic, came complaining of severe cough, which was worse at night, and in whom there were no signs of bronchitis. There were no typical paroxysms as yet. The leucocyte count was between 8,000 and 11,000 in these cases. Because of positive D'Espine's signs the parents were told that the cough was due to a tracheo-bronchical adenitis and not whooping cough. The patients were allowed to run at large and infect other children until the typical paroxysms developed, which they did in each case. Needless to say these patients were taken to other physicians "who knew whooping cough when they saw it." Several subsequent cases in which there was no doubt as to the diagnosis did not show an increase in their leucocyte counts, so it was discarded as valuables in establishing a diagnosis. Not enough blood work was done to allow us to draw very definite conclusions. Perhaps it was a peculiarity of this epidemic.

Patients with typical paroxysms, and patients who had (1) a severe cough, which was worse at night, (2) absence of rales, or other signs of acute bronchitis, and (3) no fever were considered cases of pertussis. Residence in Battle Creek was considered sufficient history of exposure.

Cases	Age	Stage	Number of Injections	Course and Duration
1 Bobby N.	4 Y	Catarrhal	3	No paroxysms developed. Coughed a little at night for one week.
2 Carlene N.	6 Y	Paroxysm	3	Paroxysms stopped. Duration of cough two weeks.
3 Baby N.	10 M	Early Catarrh	3	Cough stopped after second injection.
4 Ralph C.	2½Y	Early Paroxysm	3	Paroxysms stopped. Coughed at night a little for three weeks.
5 Harry R.	5 Y	Catarrh	3	No paroxysms developed. Coughed two weeks.
6 Charles S.	1½Y	Paroxysm	5	Paroxysms diminished in number and severity. Coughed three weeks.
7 Ivan S.	6 Y	Paroxysm	3	Paroxysms stopped.
8 William S.	3 Y	Catarrh	3	Cough stopped in one week. No paroxysms.
9 Donald S.	8 M	Catarrh late	3	No paroxysms. Coughed two weeks.
10 Eldon S.	3 Y	Paroxysms severe and vomiting	2	Vomiting stopped. Paroxysms diminished in severity.
11 Fred H.	10 M	Late Catarrh	3	Mild paroxysms developed—duration two weeks.

	Cases	Age		Stage	Number of Injections	Course and Duration
12	Thomas B.	8	Y	Catarrh	5	(White blood count 8,600). No paroxysms developed. Coughed two weeks.
13	Clifford B.	2	Y	Paroxysms and Vomiting	5	Vomiting stopped after third injection. Duration of cough—two weeks.
14	Catherine C.	6	Y	Paroxysms severe and Vomiting	5	(Blood count 10,800). Vomiting stopped after third injection. No cough after fifth.
15	Don C.	1	Y	Paroxysms severe	1	No effect. Refused further treatment. Developed pneumonia.
16	Florence E.	10	M	Catarrh	2	Had a paroxysmal stage—course six weeks. No appreciable effect from vaccine.
17	Olive F.	7	Y	Catarrh	4	No paroxysms developed. Cough stopped after 4th injection.
18	Donald F.	7	Y	Paroxysms	5	Paroxysms stopped after third injection. Cough stopped after 5th.
19	Cecil N.	6	Y	Paroxysm severe	4	Little if any improvement. Reaction.
20	Robert M.	5	Y	Paroxysm early	4	Paroxysms diminished in number and severity. Duration three weeks.
21	Alice M.	10	M	Catarrh	3	Developed mild paroxysms. Duration three weeks.
22	Chandler L.	5	Y	Catarrh	3	No paroxysms. Coughed at night for two weeks.
23	Howard L.	4	Y	Paroxysms	2	(White blood count 8,100). Did not return for subsequent injections. No report.
24	Billy H.	4	Y	Catarrhal late	2	Cough stopped.
25	Frank H.	20	M	Catarrh	3	Cough stopped.
26	Linner H.	20	M	Catarrh	5	No paroxysms. Coughed a little for two weeks.
27	Frances A.	2	Y	Catarrh	3	No improvement. Reaction.
28	Ladell N.	8	Y	Paroxysm	4	Paroxysms stopped. Coughed 4 weeks.
29	Elaine N.	10	M	Catarrh	4	Cough stopped 1 week. No paroxysms.
30	Bonnie C.	4	M	Catarrh	4	No paroxysms developed. Coughed three weeks.
32	Marie L.	4	Y	Paroxysms severe and bronchial asthma	4	Paroxysms and asthma stopped after two injections. Cough stopped after four.
31	Roy L. Jr.	6	Y	Mild Paroxysms	3	Cough stopped after third injection.
33	Baby L.	8	M	Catarrh severe	4	No paroxysms developed. Coughed two weeks.
34	Ann L.	3	Y	Mild Paroxysms	3	Cough stopped.
35	Ned H.	4	Y	Paroxysms moderate	4	Cough stopped.
36	Rodney H.	1	Y	Paroxysms severe	4	Paroxysms stopped after 3 injections. Coughed 2 weeks.

The dosage used in cases over one year of age was .25 c.c. for the initial injection, increasing this by .2 c.c. for each succeeding injection. In cases under one year .2 c.c. was given at the start and increased by .15 c.c. Injections were given 48 hours apart.

As a rule infants require a greater number of injections, due probably to the fact that the dosages are smaller and that it takes a greater number to reach a dose of effective size.

The average number of injections in this series was 3.4. It will be seen that the minimum number of injections to be effective is 3. In several cases this was not sufficient so the treatment was continued until results were obtained.

There was considerable variation in the individual reactions to the vaccine, some patients responding after the second and occasionally after the first dose, and others showing little improvement until after the third or fourth.

In this series there were only two patients who exhibited any reaction and that consisted of moderate redness and swelling at the site of injection with tenderness over the upper arm. These cases were Nos. 19 and 27. The injections were given four times in the former and three in the latter, but the dosage could not be increased so that little or no results were obtained.

In some cases the mothers were satisfied to have the vomiting and severe paroxysms alleviated and did not bring the children back for a sufficient number of injections to give the best results.

The results in the patients that were vomiting were the most striking. Case No. 14 is an excellent example. This patient was brought to the clinic when her cough first began but because of the low leucocyte count treatment was not started until the paroxysmal stage was well started and the diagnosis definitely established. This stage was unusually severe with vomiting after practically every meal. Not only did the vaccine stop the vomiting and paroxysms, but after the 5th injection there was no coughing.

Cases No. 31, 32, 33 and 43 were striking. They were all in the same family and when they were all in one room in the house, they created quite a symphony of coughs and whoops. Roy Junior had a typical bronchial asthmatic attack accompanying his whooping cough. At the time of the second injection there was noticeable slowing of the tempo and after the third injection there was practically no coughing heard in the house. Roy Junior's asthma was entirely relieved by the second injection.

Two patients (not included in this series) who had had whooping cough in November,

came into the ward with pneumonia in January and developed the typical paroxysms during this illness. They were treated with the vaccine with little, if any, success.

In only one case treated with vaccine was there any complication of the disease. This was No. 15, Don C., who had only one injection and who developed broncho-pneumonia, from which he recovered. The epidemic was not unaccompanied by complications, as we saw several cases of broncho-pneumonia in patients who had not had treatment for their pertussis.

A cough sedative was used, usually small doses of codeine, during the initial period of treatment when the dosage was still too low to be effective.

We had some difficulty in making the parents continue to keep their children quarantined for the required period, as they felt that they should be released when the cough stopped. This was the most disagreeable phase of the treatment.

CONCLUSIONS

1. Thirty-six cases of pertussis treated with a combined commercial vaccine are reported with improvement in thirty-three.
2. The average duration of the disease after vaccine therapy was 2.1 weeks.
3. The majority of cases require a minimum of three injections for appreciable effect.
4. There were no complications in thirty-five cases which received effective treatment.
5. There were only two patients who had reactions to the injections. These were purely local and not of a serious nature.

DISCUSSION

Dr. David M. Cowie (Ann Arbor): I am particularly interested in the blood count. How many of those cases did you do blood counts on, Dr. Russell?

Dr. Edwin P. Russell (Battle Creek): Half a dozen.

Dr. Cowie: Did you make differentials?

Dr. Russell: Yes, they were practically normal.

Dr. Cowies: The chief point I think is your differentia count, the disproportion of leucocytes and polymorphonuclear. Very frequently in pronounced whooping cough we find leucocytes may not be higher than 11,000 or 12,000, and sometimes in the catarrhal stage in the early part of the disease the leucocyte count is not more than 6,000 or 8,000, but it will be a reversal o fthe leucocytic element, the mononuclears predominating.

Dr. Russell: I expected to hear you say that the results are due to foreign protein.

Dr. Cowie: I didn't want to ride a new horse too long.

Dr. Bertha Loveland Selmon (Battle Creek): I would like to ask if the members have had ether injections in these cases. There were a few cases reported in the American Medical Association Journal which were successful. In your experience what has been the effect of ether? I would like to know just how young we can start in on those injections.

Dr. R. M. Kempton (Saginaw): What has been the effect of the quartz light in these cases?

Dr. David M. Cowie (Ann Arbor): I might say that I was very much interested in the treatment from the standpoint of foreign protein. Because I have talked so much about foreign protein, I thought I would leave it to the rest of you to discuss.

I feel quite sure that many of these cures might possibly be brought about by the injection of cholera bacilli or dead typhoid bacilli. We have not a large series like Dr. Russell has, but we have made some observations where we felt the foreign protein itself was responsible for the beneficial results obtained from the injection of the vaccine.

We are finding now in hay fever that foreign protein is giving us results in the active stage of the disease. That makes me feel all the more sure that a good deal of the beneficial results obtained in the treatment of pertussis by the use of vaccine is probably due to the foreign protein itself and not to any specificity of the organism.

Dr. Edwin P. Russell (Battle Creek): This preparation that I used was put out by Parke, Davis & Co. and is called "Pertussis Vaccine Combined." It is P. D. Bio 620 that I use. They have two preparations and this is called the combined.

I have had no experience with ether injections. I saw the article recently but I have had no cases since I saw that article, so I have had no opportunity to try it. I did try X-ray in some cases with very little success.

I feel that a child of any age can receive this. I think the youngest child I have given it to was six weeks of age. Infants seem to have less reaction to the vaccine than older children. They apparently do not even have tenderness at the site of injection for any time afterward. Of course I keep the dose down perhaps smaller than is necessary in small infants. I didn't want to get any reactions in infants because the mothers were very fearful about injecting something into a tiny baby and I had to be doubly cautious with them.

I have not tried the effect of quartz light on these patients. Our light was used with children who needed the treatment for other things, and we did not feel we should try to get these children who had pertussis in there at the same time. Our space was rather limited. In order to handle the infections, the contagious phase of the disease, we had to do away with some work that we would like to have tried.

I rarely had a patient with fever. I think the average temperature might have been 100 in the early stages and perhaps 101, never more than 101 rectally. As a rule there was a very slight elevation of temperature. I believe that an acute rise of temperature means some complication of pertussis.

PSYCHOSES ASSOCIATED WITH GOITRE

CHARLES E. BOYS, M. D.
KALAMAZOO, MICH.

The susceptibility of the nervous system to the toxemia of goitre is well known. Although the usual manifestation is stated as "nervousness," yet a considerable number of cases become much more severely affected; so much so, in fact, that they assume a strong resemblance to, or actually are, psychoses.

Crotti describes the nervous characteristics

of Basedow's disease as emotionality, irritability, restlessness and instability, and the more severe cerebral disturbances as obsessions, impulsions, hallucinations, and mental confusion. He rather favors the idea that insanity and Graves disease are only associated conditions. McGarrison, on the other hand, states definitely that actual mania, melancholia, or dementia may occur as a result of goitre.

In our own series, we have encountered these more violent mental symptoms in about 2 per cent of all cases, and these are so well marked that they, in our judgment, should be called definite psychoses.

Case No. 1, Mr. J. O'B.—Single man, aged 27, had been committed to two or three asylums for the insane. The diagnosis was not obtained from either of these institutions, but when he was admitted for operation in March, 1924 he was suffering from delusions, especially manifested by fear in the night. He was obsessed by the desire to conduct a "hold-up" which, however he never did. At times he would be so extremely nervous and excitable that for several hours at a time he could not work. Clinically he had a moderate sized adenomatous goitre, with a pulse of 80 —metabolism not taken. The goitre had been present for several years. Subtotal thyroidectomy was done in March, 1924. A recent report from his physician states that the mental symptoms have disappeared, and that the patient states that he never felt so well in his life. The county agent, who had largely kept him before states that the patient is no longer one of his charges, since he now supports himself as a janitor. At operation the gross findings in this case was a large hyperplastic goitre, containing adenomata in both lobes. No microscopic study was made.

Case No. 2, Mrs. J. H.—Married woman, aged 36, "nervous breakdown" occuring before marriage, and a definite hyperthyroidism with each of three pregnancies, each attack being worse than the former. During the last exacerbation the patient developed definite mental symptoms, the chief one of which was that her husband was devoting himself to other women. She would listen in on his telephone, spend her time coming unexpectedly into his office, and even attacked an entirely innocent party, striking her and roughly accusing her. Her obsession took the form of endless accusations and tearful complaints. Thyroidectomy was done when she was three months pregnant, with a complete and prompt subsidence of the mental as well as the other goitre symptoms.

The pregnancy continued and terminated normally, but the mental and other symptoms subsided within a month after operation. A multiple adenomatous goitre was found at operation. There is no history of mental disease in the family. Goitre for years, exaggerated by pregnancy, mental symptoms developing and cured by thyroidectomy in the presence of pregnancy, argue strongly that goitre was the actual causal factor.

Case No. 3, Mr. H. C.—Married man of 34, no history of insanity in his family. Had a progressive hyperthyroidism over a period of several months. Metabolism plus 65 to plus 79. Mental symptoms came on. He had a very strong delusion that members of the family were talking about him, plotting him harm, and to protect himself he obtained a revolver which he kept under his pillow until discovered and removed. He sprang from the window of his room one day in order to escape an imaginery foe. He also became violent. Ordinarily an amiable and devoted husband, he one day in a fit of anger jerked the telephone loose from its moorings and threw it at his wife. His family spoke of him as being first "flighty" then "irrational" and then "insane" but re-iterated their statement that he "never acted this way before this goitre came on." While this patient was a desperately sick man, he did not assume what could be called a terminal delirium. Double ligation preceding a subtotal thyroidectomy was followed by a complete recovery in all respects. No other cause than the goitre could be found.

Case No. 4, Mrs. L. M.—Married woman aged 45, ordinarily accustomed to hard work, had for two or three months been losing strength and becoming nervous. Several weeks before admission to the hospital she became greatly depressed mentally, and cried almost continuously during that period. With the crying she almost entirely refused food. She was constantly watched by the family, who were certain she would have to be committed to a hospital for the insane. Examination revealed a walnut sized adenoma in the thyroid, the gland being apparently otherwise normal, yet the metabolism rate was plus 69. Subtotal thyroidectomy was followed in two or three months by complete recovery from mental as well as other symptoms. The pathological report quoted "Suggests a Lugolized Graves constitution thyroid, containing adenoma which suggests early malignancy."

Case No. 5, Mr. E. B.—A large robust man of 57 years, weighing over 200 pounds, and a butcher by trade. Had to quit work one year before he entered the hospital in July 1923, because of mental depression, loss of strength and sweating. He cried a great deal, whether in his home or in his shop. He could not wait on a customer without leaving to have a crying spell. He apparently cried without reason. He had had a similar attack five years before, and was completely cured by a lobectomy. Pathological report quoted "old adenomatous goitre, no parenchymatous hypertrophy."

Improvement again followed thyroidectomy but symptoms again recurred after about one year since when he has become gradually worse. A recent report is that he was discharged because of general inefficiency and indifference. It was then learned that his mother spent the last 20 years of her life in a rocking chair on account of distinctly disturbed mentality.

Case No. 6, Mrs. L. C.—Married woman, five children, aged 37, no history of insanity or of goitre in her family. She developed the usual symptoms of hyperthyroidism about a year and a half before admission to the hospital. In addition she developed a marked mental confusion a few weeks before admission during which time she did not recognize members of her own family. Extremely restless and disturbed after admittance, would not eat and was very wakeful. Mouth became very sore Her pulse was only 110 to 120, and she was otherwise not sick enough for terminal delirium. Thyroidectomy was followed by a complete subsidence of the above symptoms eight days post operative, with a complete physical recovery in three or four weeks. Hyperplastic gland.

Although this patient was in the hospital for three weeks, when discharged she said she did not remember being brought there, did not remember being operated, also said she hoped she might be able to see her surgeon some day, as she would like to know what he looked like. (He left town one week after the operation, but had previously been in daily attendance).

Case No. 7, Mrs. Ida H.—Age 49, married, three children, three to six months of goitre symptoms, with marked emaciation. and pulse of 140. Maniacal symptoms developed, she was noisy constantly repeated statements, had to be restrained in order to keep her in

bed. Nothing could be accomplished in the way of attention except by force. She would not eat or drink, and her mouth became sore. She failed to recognize her surroundings, and on one occasion attempted to escape in a short nightgown, and stockings, these latter being tied on in many places. With a suitcase in her hand, she thus started down the corridor crying out that she must "go home." Her resistiveness was marked, and force only had any effect on her. Thyroidectomy was followed by a marked mental and physical improvement while in hospital, in all four weeks, with a complete clearing up of all symptoms within two months of the time of discharge. There was no history of insanity in the family, although the patient was illiterate. The gland grossly was of the hyperlastic type, as in hyperthyroidism. No microscopic study was made.

This type of psychosis is called by Crotti an "acute delirium" yet if the same symptoms were dissociated from a goitre they would undoubtedly be called a definite psychosis of the manic depressive type. The writer feels that these are as much definite entities as is the so-called "puerperal insanity" and as definitely related as to cause, and that goitre must be considered a cause of mental derangement.

Case No. 8, Mrs. B.—Aged 43, married 21 years, six children. Had been suffering for three or four years with symptoms later diagnosed by competent neurologists as Dementia Praecox. Had a small goitre since puberty. Pulse of 80 metabolism plus 2. Under pressure from the family a subtotal thyroidectomy was done, February, 1925. Pathological report: 'Old colloid goitre, with calcification of much of the colloid, increase of stroma, no epithelial hypertrophy or lymphoid hyperplasia. No evidence of Graves "Constitution." Recovered from the operation but did not improve mentally. In May, 1925, mental condition was less satisfactory—"patient very negatavistic, and required tube feeding." Was however, discharged from the State hospital in June of the same year as "improved." Report September 1926 stated that she died one month before, cause not known.

This patient is of interest in connection with the report of A. B. Kanavel, who has shown encouraging results in dementia praecox in those operated early in the disease but no improvement in those operated later. Most of his cases were colloid goitres.

Winslow also forms practically the same conclusions as given by Kanavel.

It may be noted that cases 1, 2, 3, 4, 6 and 7 were grossly or microscopically definitely pathological and the goitre symptoms preceded the psychoses. These cases were all cured. In case 5, the gland was adenomatous but had no parenchymatous hypertrophy and the pulse was only 72. Case 8 showed a simple colloid non-toxic goitre. In both cases 5 and 8, we had therefore non-toxic goitres, and also the mental symptoms were of long standing and not preceded by goitre symptoms.

It is the writer's belief that when thyroidectomy is done for mental symptoms, it should be at least a major portion of the gland, usually subtotal.

DISCUSSION

Dr. Nathaniel Gates (Detroit, Mich.): Dr. Boys has brought a very interesting and important communication before the surgical section because the topic has not been strictly a surgical one. That the psychologic attitude of people preceding an operation is attracting a great deal of attention in the profession is evident from the important communication addressed to the American Surgical association this year by its president, Dr. Gibbon, which is entitled, "The Psychology of the Operative Case."

It is becoming increasingly evident that a great many patients go through the clinical, surgical details of an operation but very often their emotional mechanism does not survive the element of trauma inflicted by the operation which precipitates the acute psychotic state which is impending.

My interest is somewhat attracted to this subject because at the present time I am observing two cases of postoperative psychosis following exophthalmic goitre operations, one performed by Dr. Crile in Cleveland and another by experienced and outstanding surgeon of Detroit.

Dr. Boys' communication is of especial interest, I think, because he discusses the pre-operative psychosis which has been remedied by the surgical procedure adopted.

So far as the relationship of a thyroidectomy in dementia praecox is concerned, in about 1905 Halstead and Berkley of Baltimore believed from a study of praecox cases there was an element of thyroid in those cases. Dr. Halstead at that time did a number of partial thyroidectomies with these cases with no remarkable results and the operation was dropped and it was decided it had no specific relationship to the dementia praecox except there was adolescent increase in the thyroid incident to the aged period of the subject.

It was my good fortune to have a young man come under my care in 1906. He had a type of dementia praecox which I took to Baltimore and a partial resection of the gland in hand was done by Dr. Halstead, with no result as far as the patient's condition was concerned, and death resulted later. Dr. Halstead's opinion at that time was subsequently expressed to me that that operation had no place in the treatment of dementia praecox. From my own study of the literature and some observation of the cases, I don't believe that the dementia praecox can be cured by any surgical operation.

Cases of psychosis following thyrotoxic states are best expressed in terms of Coste and Mitchell who discussed the subject some years ago in Philadelphia and concluded that the postoperative psychosis in surgery was nothing more than the explosion of the motive gun. That was the expression they used.

We have cases we are observing at the present time. Dr. Barrett has a case of that type, a young woman who was operated in June for a progressive goitre. Another case is a young man entered by Dr. Crile. The postoperative result in both was indentical, a splendid surgical result, but a mental dissolution of the patient. Both of these cases are suffering from acute mental disturbances which is becoming a chronic type, and in the judgment of Dr. Barrett is a stupor of a toxic type. There is an element of terror expressed by the patient in all of her spoken expression, attempting to escape from death and terror, the actual state that is so well defined in a study of a severe case of exophthalmic goitre preceding operation.

I think the most important thing today preceding an operation in an intensely toxic thyroid is the very careful study of the patient from the standpoint of the emotion expressed by the individual; the element of heredity must not be lost. In other words, a most exacting and careful history must be taken and every possible study to bring the patient's mental attitude to an operation must be made. If it cannot be done by

the surgeon, he should have a trained physician or a sane psychiatrist. If I had more time I could dwell on the question of modern psychiatric literature, which is attempting to read into many of these cases so-called fradulent complex and speaks of them as dis-association of the mental condition of the patient in which the element enters into it and they term it a suppression of neurosis. As a matter of fact, all of these acute manifestations in early adolescent life, if your mind is running in that lirection, can almost be reduced to a basis of a fradulent type. That is the reason I use the word "sane." I am speaking of a man, of which Dr. Barrett is the finest kind of an example, who approaches all his cases with an open mind and does not treat his cases with a particular differentiation of mental process, which some mental writer has formulated.

Dr. H. E. Randall (Flint, Mich.): I just want to add one sentence. At Lapeer, the state home for feeble minded, called the Michigan Home and Training School, in the 20 years that I have been going over there we have had only one case of toxic goitre.

Dr. C. E. Boys: One of these cases, the most severe one, was diagnosed by Dr. W. A. Stone, now deceased, formerly of the State Hospital at Kalamazoo. I didn't think the patient was a goitre case and thought it was just a case for the asylum, but he said it was not and I should remove the thyroid. He took occasion to remark at that time that as he looked back over his 25 or 30 years' experience in the State hospital, there was a very considerable percentage of cases that, perhaps in the light of what he knew then, could be explained by toxic thyroids.

I have had very little postoperative psychosis develop. In the thyroids the most marked one was a most unusual and violent case of chorea. I never saw but one chorea which developed prior to thyroidectomy. This was of short duration and the patient progressed very satisfactorily.

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A RESUME OF, AND EVALUATION OF SYMPTOMS AND SIGNS IN THE DIAGNOSIS OF TOXIC GOITRE

HENRY J. VANDEN BERG, M. D., F. A. C. S.
GRAND RAPIDS, MICH.

The present day teaching divides toxic goitre into two main classes—namely, exophthalmic goitre (hyperplastic type) and toxic adenomas. If a toxic case cannot be placed in either class it is often called the mixed type. Although this differentiation or classification is questioned by some, it will be adhered to in this paper.

It is simple enough to recognize a full-blown case of exophthalmic goitre—in fact there is probably no disease in which one can make a snap-shot diagnosis with as high a percentage of correctness as in this condition. A glance at such a patient is sufficient. His staring, scary, blinking and protruding eyes are almost pathognomonic of the disease. His manner is restless and his speech is often so rapid that it resembles stuttering. The words fall over themselves, as it were, an expression of psycho-motor hyperactivity. All this information is obtained without a history or physical examination.

Thyroid—Upon examination there is usually (not always) an increase in the size of the thyroid and it may be irregular, as usually obtains in the adenomatous goitre. An enlarged thyroid is not necessarily toxic, but on the other hand the thyroid need not be enlarged to be toxic. There may be or may not be a thrill or bruit.

Cardio-vascular—There nearly always is tachycardia and cardio overaction. The latter symptom and sign is of greater importance than is usually given it. There usually is vasomotor instability and interesting blood pressure values obtain as a rule. The systolic pressure is usually somewhat, or may be considerably, increased, and the diastolic pressure is relatively low, and the pulse pressure high. There is often the feeling of undue body warmth. Finally in the cardio-vascular chapter of the disease, irregularities and decompensation may supervene.

Nervous system—Besides the characteristic restlessness, there usually is a fine tremor of the finger and the patient often complains of feeling trembly or shaky. Muscular weakness, not ordinary fatigue, is one of the outstanding symptoms.

Gastro-intestinal—The appetite in some cases may be poor, but as a rule it is normal or increased. There may be some increase in weight for a time owing to the greater intake of food, but ultimately there nearly always is loss of weight. Nausea, vomiting and diarrhea, if present, usually occur when the toxicity is extreme.

Metabolic rate—Toxic goitre is characterized by an increase in the basal metabolic rate, although it is not pathognomonic of it.

The fact is, few cases present a syndrome as complete as that briefly sketched above. We should aim to recognize early symptoms and signs—only a single one present, as for example, a staring eye, should lead the way to theh working out of a diagnosis of this important disease. We shoudl ever have the subject in mind when a history is obtained, and as well during the physical examination.

The layman today is already sufficiently conversant with goitres to himself interpret enlargement of the thyroid as reason for seeking medical opinion and advice. Many understand that nervousness is of thyroid origin. We physicians must at least measure up to this popular

knowledge and, of course, should be far ahead of it.

The diagnosis of goitre is difficult because not one of the symptoms or signs is pathognomonic. Any of the cardinal symptoms and signs may be present in other conditions. Moreover, they do not always come in a regular, orderly sequence. For example, gastro-intestinal symptoms which usually are late symptoms may be one of the first to appear. This is illustrated in the following case history.

A married woman, aged 51, mother of four children, fundamentally not robust, of a nervous temperament, however, has always had fair health. Two months ago she was taken with influenza that confined her to bed for two weeks. She then was up and around the third, fourth, fifth and sixth weeks without gaining strength. In fact she grew progressively weaker and returned to bed the seventh week. During this week she lost her appetite almost completely. The beginning of the eighth week the patient began to have nausea and vomiting which continued the entire week. At the end of this eighth week I first saw the patient. On examination she was found to lie quietly in bed, but there was a suggestion of a stare, and she was slightly flushed. The thyroid was one plus enlarged, without a thrill or bruit. The heart rate ranged between 110 and 120. There was definite cardiac overaction both to auscultation and palpation. There was a questionable tremor. The temperature was 99 plus.

DISCUSSION

The gastric symptoms came so rapidly that the usual nervous symptoms, so characteristic of exophthalmic goitre, had for some reason not appeared. It might be mentioned that for one so weakened as the patient was, she impressed one as being somewhat more stimulated than one would expect to see in an ordinary case of exhaustion. *She was not restless.* The suggestion of a stare was a sign to be considered, pointing possibly to goitre origin. The patient's husband stated, however, upon questioning, that he could not notice any difference in the appearance of her eyes. The heart rate was of no importance in one so weakened. However, the cardiac overaction was, in my opinion, extremely important and largely on the strength of it the tentative diagnosis of toxic goitre was made. A possible gall bladder had to be considered seriously since the stomach symptoms dominated the picture (nausea and vomiting), but cardiac overaction does not obtain in an ordinary case of exhaustion. On the contrary, the heart action and tones would tend to be weaker rather than increased.

Parenthetically I wish to emphasize the value of cardiac overaction in the diagnosis of goitre. It occurs temporarily during an ordinary physical examination of neurotic people who are excited because of examination. Cardiac overaction also occurs in anaemic patients because the heart is sending through it a larger quantity of blood in an attempt to keep up its oxygen carrying capacity to normal. Overaction caused by a thyroid toxicity is entirely different from overaction resulting from hypertension. In the latter there is a heaving action confined to the left heart. Overaction in the right heart, caused by obstruction in the pulmonary circulation also produces a heaving. The overaction in toxic goitre is slapping, not heaving, and the entire heart takes part in the overaction. The greatest impulse is usually centered at the left sternal border, in other words, the location of the center of the heart. To obtain the greatest clinical aid from this sign an intensive study of this behavior is necessary.

To return to the above case, Lugol's solution was administered rectally in large doses, both for diagnostic and therapeutic purposes. In thirty-six hours vomiting had ceased. The patient was in an outside hospital where there was not a metabolism apparatus, but one was obtained purposely for this case, and on the third day the basal metabolic rate was determined and found to be 35 plus. In three weeks the patient was operated. She made an uneventful recovery. Strange to say as the time went on the eye symptoms became more and more pronounced, until now, three months after operation, they are more definite than they have been at any time. There is a very definite stare, slight exophthalmus, and a positive lid lag, although the general condition is in every way improved. The appetite is good and there is a gradual increase in strength and weight. She is calm and relaxed. There still is some cardiac overaction, but it is definitely less.

In doubtful cases then, Lugol's solution may be administered to advantage for diagnostic purposes as obtained in this case. Likewise in the following:

A business man, aged 65, in vigorous health until first of April. Following a "heavy cold" he noticed that he tired more easily and with it was a beginning loss in weight. Both continued and progressed. In the four months to follow there was altogether a weight loss of 45 pounds. He was probably slightly more nervous than formerly, but he complained particularly of feeling shaky. Upon standing there was definite shaking of his knees. There was slight nausea on two occasions, and he was bothered considerably with gas in the bowel. At one time there was said to have been some sugar in the urine.

The physical examination showed that the patient had lost considerable weight, but there was no anaemia. He did not appear fatigued despite the loss in weight probably because of the stimulation. There was a suggestion of a stare, but no other eye signs. There was no thyroid enlargement. The pulse rate ranged between 100 and 110; blood pressure 168/70. There was slight cardiac overaction, but no apparent vasomotor instability. There was a moderate degree of arterio-sclerosis.

Four conditions seemed to present them-

selves for differential diagnosis. *First,* some hidden malignancy, most likely located in the gastro-intestinal tract, but all investigations made with this in view were essentially negative; *second,* failing health from a general breakdown was thought of, especially so since several members of his family gave a history of having a breakdown rather early in life; *third,* diabetes, since it was suggested in the history, but investigation along this line proved negative; *fourth,* toxic goitre and this possibly seemed more likely after having ruled out as far as possible the other conditions mentioned. A metabolism test was made which showed a 69 plus. These values together with the suggestion of a stare, the weight loss, and muscular weakness and shakiness of his knees, which was a rather unusual sign, the absence of anaemia, and the low diastolic pressure suggested the administration of Lugol's solution for the purpose of aiding in the diagnosis. In about three days the patient began to feel better, the shakiness disappeared, the muscular weakness improved and in ten days he was able to get up on a chair from the floor, which he could not do before, and it was noticeable to him that he felt relaxed. The metabolic rate ten days from the beginning of Lugol's administration was 35 plus. This case is in the hospital at present. We feel reasonably certain of the diagnosis and with all the circumstances considered, we plan to ligate the superior thyroid arteries within a few days rather than do a thyroidectomy.

In given cases there are still indications for ligation. This case again illustrates the value of iodine as a diagnostic agent and as well the metabolic rate determination.

The psycho-neurotic patient, the neurasthenic, cases of anxiety, neurosis and neurovascular asthenia all offer problems in the diagnosis of toxic goitre. They may present many of the symptoms and signs of toxic goitre although they are temporarily in nature, but this point must be definitely determined. Needless to say neurotic individuals may have toxic thyroids. In fact, I have regarded certain neurotic patients as potential thyroid cases. It is often necessary to see such patients on different occasions and under different circumstances in order to arrive at a definite diagnosis. Even metabolic rates may be misleading and therefore should be repeated in not so few instances in order to get its true meaning. One of the most valuable symptoms in the differentiation of a neurosis from a toxic goitre is the matter of fatigue versus weakness. The neurotic patient becomes fatigued; that is, a temporary fatigue, and it often comes on suddenly. It disappears of itself but will be hastened by lying down a short time or after taking of food. The toxic goitre case is weak (not fatigued) and it is constant.

We have operated during the last year a half dozen cases of toxic adenoma with cardio irregularity, in patients in the late sixties and early seventies, with excellent results. These patients were picked out by a very capable internist who had differentiated them from cardio-vascular conditions or possibly a cardio-reno-vascular syndrome. I believe this is a condition that deserves earnest consideration since well selected cases can be offered worth while improvement by removal of the thyroid. Well understood blood pressure values are invaluable in selecting such cases. Briefly stated, a diastolic pressure remaining at 80 or below with the systolic pressure at 150 or above, point to a thyroid influence, especially if there is an increase in the pulse rate. Diastolic readings of 100 or above in cases of high systolic pressure speak against a thyroid influence.

I wish to point out the importance of picking out thyroid factors in surgical cases of any kind, since the hazard of operating for any cause in the presence of toxic goitre is great. In this relation I have seen one death because the condition was not recognized. Such patients should be prepared for operation by means of the administration of iodine the same as one would if he were to operate a thyroid case, if such a sequence is indicated. Generally speaking, however, thyroid toxicity, if present, is usually more important and should have attention first.

IN CONCLUSION I WISH TO EMPHASIZE

1st. The importance of cardiac overaction as an almost constant sign in toxic goitre.

2nd. The value of the use of iodine as a diagnostic aid.

3rd. The diagnostic value of fatigue vs. weakness in the differential diagnosis between neurotic conditions and toxic goitre.

4th. The importance of recognizing toxic thyroid factors in surgical conditions of any kind.

5th. The aid that may be given certain heart conditions by operating upon the thyroid.

DISCUSSION

Dr. C. E. Boys. (Kalamazoo): I think as we know more and more of goitres we go into these finer details than we did formerly. Some of the most unexpected things occur. I have in mind a case that was sent in for gall-bladder operation and during the routine examination, I discovered an unusually rapid heart for gall-bladder; it was runing about 120. I could find no cardiac disease like a murmur that would explain such a rapid rate. Then I thought of the matter of goitre as a possibility. I looked at the

patient's neck and it was one of the most scaphoid, goitreless necks you ever saw. It looked like a pair of sternum mastoid muscles hung around a skeleton; there were deep depressions from every side of the neck. I put her chin up and almost by accident I observed some little bit of a thing coming up from behind the sternum which proved to be a large substernal thyroid and absolutely answered the whole question; so thus in an almost unexpected manner we may find answers to the question of diagnosis.

It is amazing even yet how many of these goitre patients are treated for heart disease for weeks and weeks, despite all that everybody seems to know about the relation of tachycardia to goitre.

Dr. Henry J. Vandenberg: Just in that connection, I had a case come in for treatment with a definite gall-bladder history. We recognized in her that she had a goitre and advised that she have this taken care of first, which she did. She returned a year and a half later to have her gall-bladder removed. She said, "I have been having so much trouble and more and more as the time has gone on, and I have decided now the gall-bladder must be removed."

This patient again presented at this time definite signs of thyroid intoxication. She had had so much trouble with her gall-bladder that we sent her to the hospital and prepared her in the way that I suggested, for 10 days or two weeks, with iodine and operated her gall-bladder and she went through it without any trouble at all.

SECONDARY ABDOMINAL PREGNANCY WITH INTRA AND EXTRA-UTERINE PLACENTA—CASE REPORT

DON H. DUFFIE, M. D.
CENTRAL LAKE, MICH.

Mrs. D. W., white, age 34, healthy mother of two sturdy children, came in the third month of gestation, with a history suggesting ruptured ectopic pregnancy, except for apparent absence of hemorrhage. A second attack occurred about two weeks later, still her condition continued fairly good. The uterus increased normally in size during the ensuing weeks, so suspicion of ectopic pregnancy was abandoned.

Throughout the pregnancy, though not nauseated, she suffered continued and marked gastric discomfort, belching much gas, which she had never before done.

Living at some distance, she failed to come in again during the later months, till after her expected confinement date. The fetal head was then found startlingly close to the surface, in mid-line, just distal to the navel. Some unfamiliar type of transverse position being supposed to exist, a large bag was introduced into the cervix, without anything unusual being noted.

Energetic pains promptly followed, expelling the bag a few hours later, with practically full dilatation, but only trivial hemorrhage. Not until then was found what was taken to be a high central placenta previa, making the absence of hemorrhage quite puzzling.

Section being rejected, version was proceeded with, an interminable thickness of placenta (also the uterine wall, as later appeared) being torn through in order to reach the fetus.. A foot was readily brought down and traction maintained, in the supposition that hemorrhage was thereby controlled. External bleeding was checked, but the woman died (undelivered) a few minutes later from profuse concealed hemorrhage.

The uterine placenta, of annular type, rolled into a ball, had occupied the entire fundal cavity. From the cord, an isolated strand of vessels led out through a large rent in the uterine wall to an accessory placenta attached to a loop of intestinal.

Next day, aided by Dr. Rulison, of Lansing, necropsy was obtained. The uterus was of bicornate type, right cornu being represented only by its distended lateral wall, medial wall being absent. The viscera were welded by dense adhesions into a single mass, partly enclosing a nest in which the fetus had lain: amply explaining the gastric disturbances. Tags of tissue, later identified as placental by Dr. Warthin, were found on various coils of intestine, while from the secundae several strands of broken-off vessels had evidently led to these accessory lobes.

The ball of uterine placenta was nearly enclosed in membrane, leaving little villous surface, showed slight vascular connections, and was apparently almost non-functioning. The cord took origin from a plexus of vessels in the membranes, having but the slenderest connection with the uterine placenta.

PUBLIC HEALTH ACTIVITIES

Edited By

MICHIGAN DEPARTMENT OF HEALTH

OUR ROADSIDE WATER SUPPLIES

Highway travelers in Michigan stand a better chance than they did a year ago of getting safe drinking water along the roadside. "This Water Safe for Drinking, Michigan Department of Health, 1926," has become a familiar sight along most of the trunk lines, and popular interest has apparently increased with the signs.

Systematic survey of drinking water supplies likely to be used by travelers on the highways was begun in the summer of 1925. Starting late in the season, about 1,780 miles of road on four trunk lines were covered. In all, 427 sources of drinking water were investigated,—samples tested, premises thoroughly looked over, owners instructed, and placards posted.

With an earlier start in the summer of 1926, the number of supplies investigated was almost doubled. In the 57 days devoted to this work, from July 6 to September 13, representatives of the Bureau of Engineering covered 5,479 miles of state road—an average of 100 miles of travel per day. Thirty-two trunk lines were completely covered and parts of 10 others were included in this investigation. Samples were tested from 805 sources, an average of 12 samples per day.

Of the sources tested, 76.3 per cent were found safe, and 23.7 per cent unsafe. Of the tubular wells,—wells either drilled or driven and usually with a steel or iron pipe forming the well—79.4 per cent were safe. Of the dug wells,—wells excavated by hand, with the sides walled up,—only 21.1 per cent were safe. Of springs, 52 per cent were safe.

Whenever a supply was found to be safe, the metal approval sign was posted, informing the public that that supply was regarded by the Michigan Department of Health as satisfactory for drinking purposes.

In addition to the supplies tested, there were available along the roads traveled 52 municipal supplies known to be satisfactory through previous investigations. To most of these municipalities approval signs were furnished so that they could advertise to the traveling public the safety of their water supply.

In all, more than 600 approval signs were used.

In summing up the precautions to be observed by automobile travelers in choosing their drinking water, E. D. Rich, Director of the Bureau of Engineering says:

"First, look for the metal approval sign of the Michigan Department of Health.

"Second, carry one or more thermos bottles and fill them from an approved supply.

"Third, if you are on a county road and are unable to find an approved well do not drink from a country well unless the surroundings are exceptionally favorable. If the yard is untidy, the barn, pig pen, chicken house, or privy are near the well, or if you think there is a chance for leakage into the well, look for another drinking place.

"Fourth, do not drink from a stream if you can possibly avoid it, and then only in a region which is almost entirely uninhabited.

"Fifth, do not drink from a spring unless you are in a very sparsely settled country, and not then, if you can see any possible source of contamination."

SCHICK TEST CLINICS

The Michigan Department of Health is now conducting clinics for administering the Schick test in the several counties where toxin-antitoxin was given last year in the demonstration clinics conducted by the department.

The Schick test clinics are scheduled in about the same order as the toxin-antitoxin clinics in each county. A doctor and nurse from the department administer the Schick testing material one week, and return on the same day and hour the following week to read and record the result of the test. Where the reaction from the test is found negative, indicating immunity from diphtheria, a certificate stating that fact is given the inndividual; where the reaction is positive, the person is advised to go at once to his physician for another series of three toxin-antitoxin treatments.

In these clinics the Schick test is offered, not only to all who have ever taken the toxin-antitoxin treatments, but to anyone, child or adult, who may want to know as to his susceptibility to diphtheria. About 70 per cent of those having had toxin-antitoxin are taking advantage of the tests. The number found to be immune ranges from 80 to 90 per cent, the higher per cent of immunity being among the children who have had toxin-antitoxin.

Beginning in September this year, the order

of counties scheduled for the department Schick test clinics is Baraga, Alger, Presque Isle, Montcalm, Cass, Kent, Genesee. Clinics for the Schick test were conducted in the same manner in Ionia and Washtenaw counties a year ago.

WELLS AND TYPHOID

Investigation of an outbreak of typhoid fever which occurred in Rogers City during the months of August and September has revealed a total of 20 cases and two deaths.

The infection was traced to contaminated wells. Eleven of the individuals who developed the infection were living at a boarding house and a total of 15 were probably infected by drinking water from the well at this place. Four other cases developed in a family whose well was also contaminated and was the probable source of infection.

Of those infected at the boarding house, one person went to Detroit and developed typhoid about a week later. Another person had gone to Cheboygan and a third to Alpena when the boarding house closed. Both developed typhoid fever within a few days. A contact case developed in the family of a young man who had gone to his home in Alpena. Another case developed in Lansing in a girl who had been visiting her relatives in Rogers City and among whom three cases of typhoid fever had developed.

This outbreak is a good example of the danger which a contaminated well holds, not only for the people using the well but also for the people generally over the state.

CHECKING YOUR DIPHTHERIA DIAGNOSIS

The low incidence of diphtheria during the last 18 months has apparently led to a laxness on the part of some physicians in checking their diagnoses. The laboratory has received a number of throat swabs taken just before or after the death of the patient. In view of the almost certain rise in the diphtheria case and death rates, every precaution should be observed in diagnosis.

PRENATAL PROGRAM IN EMMET COUNTY

The services of Miss Katharine Kreizenbeck, a graduate nurse, have been offered to Emmet County by the Michigan Department of Health to do prenatal work under the supervision of local physicians. Miss Kreizenbeck will finish a similar program in Newaygo County in December, and will go to Emmet County in January, 1927. The physicians of the county have been visited and have expressed their approval of the proposed program, which consists of home calls by the nurse on prenatal cases throughout pregnancy, instructing them in the hygiene of pregnancy and keeping them in close touch with their physicians. Miss Kreizenbeck will remain in the county for a period of one year.

TO THE INDIVIDUAL PRACTIONER

It is often difficult to get a measurement of service rendered by the Michigan Department of Health to the individual practitioner. Although it is recognized that the general service of the department is enormous, specific illustrations are hard to point out. The records of the Biologic Distribution Division of the Laboratory of the Michigan Department of Health contain the best specific illustration that has come to hand recently.

During the month of October 20,000 cc. of toxin-antitoxin mixture were sent in small lots to practicing physicians to use on their own patients. These small lots were from 10 to 50 doses each and bore no relation to public health campaigns which were going on in the community. In all probability this would represent close to 5000 patients that were immunized by the general practitioner during the month of October. From material sent out from the main laboratory, the city of Detroit has dispensed to physicians a great deal of toxin antitoxin, the exact quantity undetermined, but something over 30,000 doses.

The list of products distributed free by the Michigan Department of Health is Schick matrial, toxin-antitoxin, diphtheria antitoxin, typhoid vaccine, silver nitrate ampules. In the near future, Dick test material, scarlet fever streptococcic toxin for immunization, and scarlet fever antitoxin will be added to the list.

INFANT CLINICS

Infant clinics conducted by staff members of the Bureau of Child Hygiene and Public Health Nursing during October did not start until the middle of the month, which accounts for the fact that the totals are smaller than usual. The schedule follows:

		Number Examined			
Date	Place	Boys	Girls	Total	Defects
10-13-26	Tawas City	11	12	23	34
10-14-26	Alabaster	8	7	15	29
10-15-26	East Tawas	11	9	20	32
10-18-26	Whittemore	10	18	28	62
10-19-26	Hale	1	7	8	10
10-20-26	Oscoda	7	8	15	27
10-22-26	Hillman	7	4	11	30*
10-25-26	Johannesburg	8	7	15	31
10-26-26	Gaylord	3	4	7	10
10-27-26	Gaylord	9	13	22	53
10-28-26	Elmira	12	13	25	69
10-29-26	Vanderbilt	3	3	6	13
Total		90	105	195	400*

* 1 Prenatal Examination.

THE WESTERN DIVISION LABORATORY

The Western Michigan Division Laboratory of the Michigan Department of Health opened for business on Labor Day. Notice was sent to the physicians of western Michigan that the same service was available to them in Grand Rapids as at the Lansing laboratory. From the character of the inquiries made by physicians, it was quite evident that many of them had thrown the communication into the wastebasket without even glancing at its contents.

The laboratory is running and is available for any biological or bacteriological examination that the physician needs in aiding him to arrive at an accurate diagnosis. The month of September the laboratory made 1,711 examinations, in October, 4,009.

The city of Grand Rapids has provided a splendid building and adequate equipment, and the State Department of Health has installed every modern technical convenience necessary for accurate and dependable work. Physicians in the Grand Rapids area should be proud of this division.

SIXTH ANNUAL PUBLIC HEALTH CONFERENCE

Invitations to the Sixth Annual Public Health Conference to be held in Lansing, December 1, 2 and 3, 1926, under the joint auspices of the Michigan Department of Health and the Michigan Public Health Association were sent out from the Department offices November 4 to the 2,000 health officers and public health nurses throughout Michigan.

Many names of interest to physicians as well as public health workers appeared on the program. Surgeon General Cumming was scheduled to give the opening address of the Conference, to be followed by a general symposium for both health officers and public nurses on "Accomplishments for the Year." Dr. Frederick Adams, Health Officer of Border Cities, Windsor, Ontario, was to talk on "Smallpox," Langdon Pearse of Chicago on "Sewage Disposal for Large and Small Municipalities," Dr. George H. Bigelow, Commissioner of Health of Massachusetts, on "Milk Supplies," Dr. O. P. Kimball of Cleveland on "Endemic Goitre and Public Health," Dr. Josephine Baker of the Children's Bureau on some phase of child hygiene and Dr. Harris Wilson of the Cleveland Mouth Hygiene Association on "Mouth Hygiene in Cleveland." The one open evening session, was a joint meeting with the Western Michigan Dental Association.

Friday's sessions were to be taken up with talks by William R. Davis, D.D.S., Director of the Bureau of Mouth Hygiene and Preventive Dentistry of the Michigan Department of Health, on "County Mouth Hygiene Programs," Dr. George H. Ramsey, Associate Professor of Epidemiology, Johns Hopkins University, on "The Prevention of Diphtheria," Carolyn Van Blarcom, R. N., New York, on "Prenatal Nursing," and Dr. B. Bernbaum of Detroit, on "Scarlet Fever."

SEWAGE DISPOSAL PLANT INSPECTIONS

Sewage disposal plants in Powers, Escanaba, Gladstone, Lapeer, Imlay City, Plymouth, Wayne County Tuberculosis Sanitarium, Pontiac and Royal Oak were inspected during October by Willard F. Shepard of the Bureau of Engineering.

The sewage disposal system at the State Tuberculosis Sanitarium at Howell was revamped during October by R. J. Faust of the Bureau of Engineering. The Sanitarium has the only sewage disposal system of its kind in the state, the trickling filter with stationary nozzle type.

STREAM POLLUTION PROGRESS

All of the Michigan Sugar Company factories in the state and practically all tomato canning factories in Hillsdale, Lenawee and Monroe counties, were visited by John M. Hepler of the Bureau of Engineering during October. Mr. Hepler has charge of stream pollution for the Department of Health, working with Homer Murphy of the Department of Conservation, and the Attorney General's Department. Encouraging progress is reported both by municipalities and industries along the line of prevention of stream pollution.

BY RADIO

Radio programs over WKAR in which the various state departments co-operate with Michigan State College began October 29, the Michigan Department of Health opening the series. A resume of "The Conditions of Highway Water Supplies in Michigan" was given by E. D. Rich, Director of the Bureau of Engineering, "Teaching Health to Children" was discussed by Marjorie Delavan, Director of the Bureau of Education and "Avoiding Colds" was the topic of Dr. Frank Poole, special lecturer of the department.

On December 10 the department again goes on the air, with Dr. Olin speaking on "Pneumonia," Dr. Max Marshall talking on "Making Diphtheria Antitoxin," and Dr. Lillian Smith discussing "Winter Sun Baths for Babies."

All state department programs start at 8 o'clock and close at 9.

EVALUATING BIOLOGICAL PRODUCTS

During October the department manufactured and distributed to physicians and health officers biological products valued at $15,188.90. This valuation is based upon the old contract prices held by the department, prices lower than those current today.

HAVE YOUR CONTAINERS WEIGHED

The Michigan Department of Health laboratory is having delivered daily in the specimen mail an increasing number of containers without the correct amount of postage. Postage should vary with the specimen. A container with a sputum jar or one packed with four or five blood vials will weigh more than one containing only a swab. Lack of postage delays the delivery of the specimen in the laboratory. We, therefore, urgently request the Michigan doctors to have their containers weighed and the required postage attached before sending them through the mail.

VISUAL EDUCATION

Report from the Bureau of Education for October shows a new series of five posters released for use in junior and senior high schools. The posters are 19x26, printed in black and white, on a heavy grade of paper. A total of 54 sets were sent out even before formal announcement was made that the posters were ready. Any school in the state can secure the posters without charge.

In answer to 996 requests, 70,906 pamphlets were mailed from the Department during October. By far the larger part of these were sent to teachers or public health nurses for school use.

OCTOBER'S COMMUNICABLE DISEASES

The situation in regard to communicable diseases reported for October is very gratifying, with the exception of diphtheria. This showed 792 cases reported for the month as compared with 370 cases for September and 476 cases for October, 1925. But this is still below the five year average of 934.

It is of interest to note that the very large portion of this increase occurred in the city of Detroit. For October, 1926, there were reported 407 cases of diphtheria in Detroit as compared with 194 cases in October, 1925. This is an increase of 213 cases, equivalent to 110 per cent, whereas the balance of the state increased from 282 cases in October, 1925, to 385 cases in October, 1926—an increase of 103 cases equivalent to about 37 per cent. On the whole the increase amounted to 66 per cent for the entire state. There has been a decided tendency in Detroit as well as in other parts of the state to show an increased virulence.

PREVALENCE OF DISEASE

October Report

Cases Reported

	Sept. 1926	Oct. 1926	Oct. 1925	Average 5 years
Pneumonia	112	239	337	288
Tuberculosis	509	554	353	407
Typhoid Fever	129	95	211	183
Diphtheria	370	792	476	934
Whooping Cough	517	431	521	337
Scarlet Fever	321	665	667	892
Measles	78	112	160	270
Smallpox	12	34	13	69
Meningitis	6	6	12	11
Poliomyelitis	25	32	10	51
Syphilis	1,198	1,473	1,349	972
Gonorrhea	987	1,187	1,093	963
Chancroid	11	20	9	13

CONDENSED MONTHLY REPORT

Lansing Laboratory, Michigan Department of Health

October, 1926

	+	—	+—	Total
Throat Swabs for Diphtheria	.....	.....	....	1406
Diagnosis	64	437	....	.....
Release	211	326	....	.....
Carrier	3	341	....	.....
Virulence Tests	12	12	....	.....
Throat Swabs for Hemolytic Streptococci	.....	.....	....	608
Diagnosis	103	216	....	.....
Carrier	18	271	....	.....
Throat Swabs for Vincent's	22	473	....	495
Syphilis	.....	.....	....	5619
Wassermann	1	5	....	.....
Kahn	882	4671	56	.....
Darkfield	3	1	....	.....
Examination for Gonococci	161	1192	....	1353
B. Tuberculosis	.....	.....	....	450
Sputum	90	324	....	.....
Animal Inoculations	1	35	....	.....
Typhoid	.....	.....	....	269
Feces	33	127	....	.....
Blood Cultures	2	33	....	.....
Widals	14	40	....	.....
Urine	.....	20	....	.....
Dysentery	.....	.....	....	99
Intestinal Parasites	.....	.....	....	12
Transudates and Exudates	.....	.....	....	494
Blood Examinations (not classified)	.....	.....	....	686
Urine Examinations (not classified)	.....	.....	....	314
Water and Sewage Examinations	.....	.....	....	603
Milk Examinations	.....	.....	....	93
Toxicological Examinations	.....	.....	....	18
Autogenous Vaccines	.....	.....	....	9
Supplementary Examinations	.....	.....	....	195
Unclassified Examinations	.....	.....	....	516
Total for the Month	.....	.....	....	13239
Cumulative Total (fiscal year)	.....	.....	....	54795
Decrease over this month last year	.....	.....	....	9519
Outfits Mailed Out	.....	.....	....	14443
Media Manufactured, c.c.	.....	.....	....	674350
Typhoid Vaccine Distributed, c.c.	.....	.....	....	1350
Diphtheria Antitoxin Distributed, units	.....	.....	....	59268000
Toxin Antitoxin Distributed, c.c.	.....	.....	....	116500
Silver Nitrate Ampules Distributed	.....	.....	....	3764
Examinations Made by Houghton Laboratory	.....	.....	....	1970
Examinations Made by Grand Rapids Laboratory	.....	.....	....	4009

The Journal
OF THE
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ISSUED MONTHLY UNDER THE DIRECTION OF THE COUNCIL

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J. D. BRUCE, Chairman.....Ann Arbor
B. F. GREEN.....Hillsdale
B. H. VAN LEUVEN.....Petoskey

Editor and Business Manager
FREDERICK C. WARNSHUIS. M. D.. D. Sc., F. A. C. S.
Grand Rapids, Michigan

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DECEMBER, 1926

Editorials

GREETINGS

AROUND THE CORNER

Around the corner I have a friend,
In this great city that has no end;
Yet days go by and weeks rush on,
And before I know it a year has gone,
And I never see my old friend's face;
For life is a swift and terrible race.
He knows I like him just as well
As in the day when I rang his bell
And he rang mine. We were younger then—
And now we are busy, tired men—
Tired with playing a foolish game;
Tired with trying to make a name.
"Tomorrow," I say, "I will call on Jim,
Just to show him that I'm thinking of him."
But tomorrow comes—and tomorrow goes;
And the distance between us grows and grows.
Around the corner! yet miles away . . .

* * *

"Here's a telegram, sir," "Jim died today!"
And that's what we get and deserve in the end—
Around the corner—a vanished friend.

CHARLES HANSON TOWNE

The passing years roll by with a momentum that increases in pace crowding out, far too frequently the many worth while things—especially the friends around the corner. Our social program of life has, however, established a season of respite from the days routine—a period wherein we may pause and call on "Jim," ere he departs upon life's last journey. We approach that season this month.

Our Christmas greeting then contains the sincere wish for a merry yuletide for each of our members. Attached is the wish that it may witness the renewal and recementing of friendships that we are so prone to neglect. Cultivate your friends for true friends are life's richest assets. A host of friends will bring to you the merriest of Christmases.

MINUTES—NOVEMBER EXECUTIVE COMMITTEE MEETING

The Executive Committee of the Council met in Ann Arbor at 6 p. m., Nov. 10, 1926. Present: R. C. Stone, B. R. Corbus, J. D. Bruce, President J. B. Jackson, Ex-President C. G. Darling, F. C. Warnshuis, Harvey G. Smith.

1. The secretary was instructed to advise the president of the Wayne County Medical Society that the State Society would aid in defraying the expenses of outside speakers appearing before the General Meetings of the society up to the amount of $500 . The same to be appropriated from the Post-Graduate budget and credited to the Post-Graduate work of the society.

2. The program outlined by the secretary for the Legislative Conference in Lansing on Nov. 16 was approved.

3. The dates determined for the Annual Meeting of the Council in Ann Arbor were Jan. 12 and 13, 1927.

4. The secretary was directed to invite to a Conference Dinner on Jan. 12 the following: Board of Registration, Commission of Health, Deans of Medical Schools, President of the University, Department Heads of the Medical Departments, Professors of the Detroit College of Medicine and Surgery, Members of the Council.

5. As a committee, Council or as representative of the State Society, the policy of not endorsing any candidate for state appointive office was established.

6. The advisability of compiling a state medical history and providing the necessary considerably large appropriation of funds was referred to the January Council Meeting.

7. An appropriation of $100 was made to defray the expense of the work of organizing a State Woman's Auxillary.

8. President Jackson announced the ap-

pointment of the following State Hospitals and Charity Survey Committee: R. R. Smith, Chairman; W. J. Stapleton, Jr., W. H. Marshall.

9. The secretary was directed to invite the section officers to the December Executive Committee Meeting for a conference relative to the scientific program for our next annual meeting.

10. A motion of Corbus-Bruce the senior alternate delegate was designated to serve for the Secretary-Editor in the House of Delegates of the American Medical Association.

12. Executive Secretary Smith rendered a detailed report of his work and county conferences.

Adjourned at 11 p. m.

F. C. Warnshuis, Secretary.

OUR BIRTHDAY— TWENTY-FIVE YEARS

With this issue The Journal completes it's twenty-fifth volume—a quarter of a century of existence for our official organ of publication.

Volume 1, Number 1, was issued in September 1902, the first editor being Dr. Andrew P. Biddle, then serving as secretary of our society. Dr. S. Edward Sanderson was the business manager.

The following was the opening editorial:

THE JOURNAL

"It is not necessary to enumerate the many advantages of a monthly journal over the annual transactions for a place of record of the doings of the society. One of the principal ones, however, will be the opportunity it affords to the officers of the society to come into more intimate and frequent touch with the members, and to the members to present their views, for we wish it understood that we invite to its columns all honestly expressed criticisms. The Journal is the official organ of the State and County Societies, and we expect soon to have it the record place for the proceedings of the component societies. We invite correspondence on any matter of common interest.

The annual dues cover the subscription to The Journal.

We enter the field of journalism simply as a better ground to plant the seeds of common interests and to reap the benefit of closer acquaintance. We enter with no feeling of rivalry nor competition, and to those journals already here, which have in the past graciously recorded the doings of the society, we express our sincere wishes for their continued success."

The following have served as editors:

Dr. A. P. Biddle, Detroit, 1902-1906—4 years.

Dr. B. R. Schenck, Detroit, 1906-1910—4 years.

Dr. Wilfred Haughey, Battle Creek, 1910-1913—3 years.

Dr. F. C. Warnshuis, Grand Rapids, 1914.

During the period from 1866, when meetings were resumed following the Civil war, the following have served as secretaries:

1866-1886—George E. Ranney.
1886-1890—George Duffield.
1890-1895—C. W. Hitchcock.
1895-1900—Collins H. Johnson.
1900-1906—A. P. Biddle.
1906-1909—B. R. Schenck.
1909-1913—W. H. Haughey.
1913- —F. C. Warnshuis.

Previous to 1902 the records of our society were published in one yearly volume—The Annual Transactions. We have on hand the printed transactions and minutes from the year 1820.

As one peruses these reports, extending over a century of time, the muses draw many a facinating and fantastic picture. Each issue, each period reveals men and incidents that are prophetic of the advancement of our science and the progress recorded is in many instances forecasted years before actualities were established and accepted. Some day we hope to find the time to weave into a narrative these incidents, events and facts that created and made possible our present existence and status.

As The Journal enters upon it's second quarter of a century of life the assurance is advanced that the Publication Committee and the Editor will ever conscientiously endeavor to maintain in full degree the purpose and object of existence. In doing so the inspirations of the past, the achievements of the present and the ideals of the future will govern the editorial direction.

THE ANN ARBOR CLINIC

On November 11, 12 and 13, 347 of our members attended the University Clinic held under the auspices of the State Society. The following schedule of clinics was carried out:

PROGRAM

Thursday and Friday—Hospital Amphitheatre

9:00 a. m.—Welcome.....Dr. Haynes
9:10 a. m.—Fractures.....Dr. Badgley

10:00 a. m.—Heart.....Dr. Wilson
11:00 a. m.—Neurological Diagnosis.....Dr. Camp
12:00 a. m.—Prenatal Clinic.....Dr. Peterson
1:00 p. m.—Luncheon (Ground Floor)
2:00 p. m.—Management of Goitre Cases.....Dr. Eberbach
3:00 p. m.—Hypertension.....Dr. Newburgh
4:00 p. m.—Surgical Technic.....Dr. Cabot
7:00 p. m.—Informal Dinner, Thursday, Michigan Union

Speakers—President C. C. Little
Dean Hugh Cabot
Regent W. H. Sawyer
Dr. John B. Jackson

Thursday and Friday—Pathology Amphitheatre

9:00 a. m.—Practical discussion of medical procedure with demonstration.....Dr. Youmans
10:00 a. m.—Pediatric Clinic.....Dr. Cowie
11:00 a. m.—Dermatological Clinic.....Dr. Wile
12:00 a. m.—Acute Upper Respiratory Infections and Pneumonia.....Dr. Canfield
Dr. Field
1:00 p. m.—Luncheon (Ground Floor)
2:00 p. m.—Acute Abdominal Conditions.....Dr. Cabot
3:00 p. m.—Obstetrical and Gynecological Clinic.....Dr. Peterson
4:00 p. m.—Management of Cases with Stomach and Gall-bladder Disease.....Dr. Bruce
Dr. Hickey
Dr. Youmans
7:30 p. m.—Friday, Lectures in the Auditorium of the Natural Science Building by Dr. Morris Fishbein and Mr. Lee A. White.

Saturday

8:00 a. m.—Hospital Amphitheatre—Use of Ultra-Violet Rays and Diathermy in University Hospital.....Dr. Pohle
9:00 a. m.—Hospital Amphitheatre—Head Injuries.....Dr. Peet
10:00 a. m.—Pathological Amphitheatre—Clinical Pathological Conference.....Dr. Warthin
Dr. Hickey
Dept. of Medicine
Dept. of Surgery

There will be daily demonstrations in the Pathological and Clinical Laboratories; in the wards of the hospital; in the Out-Patient Departments, and in the Department of Roentgenology.

A special demonstartion will be held Thursday and and Friday from 9:30 to 12:00, and Friday and Saturday from 2:00 to 4:30 by the Department of Roentgenology in Room 431 on Ground Floor.

The number in attendance signified the need and desire for such opportunity.

That man who is ever alert and at the call of the ill night and day within his community; That man who is ever ready to give the best he has for the advancement and preservation of his community; That man who has no deep well spring near by from which he may renew his knowledge or tap new sources and new advances came to study and to learn of those who are designated by their commonwealth to investigation, to research, to the establishment of facts in Scientific Medicine. He came not in vain but received that for which he came. His expression was an unanimous one of approval and his sincerity was evidenced by his statements and questions: "This conference will be an annual event for us will it not? and again, Will it be possible to have a one week course of study in some speciality? We ought to have more opportunity to come here for study and conference."

Dr. Clarence Cook Little, president of the university stated in his address at the dinner, that no university is worth the snap of the finger if the boundary of that institution is that of the Campus. The field of the university is co-extensive with the state or the outposts of the alumni. They are students, they have contributions to make and likewise the university has and always should have contributions to offer its ever increasing student body. The university should be the center of research and the facts revealed must become available to every alumnus for the advancement of the Commonwealth. Such is the function of the university."

The doctors who attended the conference caught the vision of the president, they caught a new vision of their science as it again took on new aspects and new endeavors. Every man returned to his own field of endeavor and accomplishment ready to aid in the true function of the university. Ready to be a more useful member of his State Medical Society.

We appreciate the services contributed by the members of the University Hospital staff. We realize the added burden that they assumed and tender the thanks of our society for the labor and effort expended for our benefit by each member of the staff.

LEGISLATIVE CONFERENCE

Upon the invitation of the State Medical Society a legislative conference was held in Lansing on Nov. 16. Participating in this conference were representatives from the following organizations concerned with health and medical practice in the state: State Medical Society, Deans of our two Medical schools, State Commission of Health, Tuberculosis Society, Nurses Association, Hospital Association, Dental Society, Board of Registration and Chairmen of Legislative Committees of several of our County Societies. The attendance numbered 94.

President Jackson presided and outlined the object of the conference. Dr. W. D. Woodward of the Bureau of Legal Medicine and Legislation of the A. M. A. spoke on Legislative Problems and Conduct. Each organization then set forth its legislative problems and needs. The points raised evoked a very profitable and enlightening discussion.

The following definite action resulted: First, that it is the consensus of opinion that the State Council of Health should secure the introduction of a bill making it permissive for counties to employ County Health Officers and establish County Health Boards. Second, that a bill be introduced permitting the employment of county health nurses, dentists and doctors. Third, that the president be authorized to invite each organization represented to appoint a representative which appointees will constitute a Central Legislative Bureau for the state in order that the legislative interests and needs of all may be centralized and correlated for the purpose of securing desired legislation and the enlisting of the prestige of these organizations in the support of indicated legislation as well as to oppose pernicious enactments.

It was felt that this conference was an epochal event by reason of the fact that it attained the union of all state organizations concerned with public health and medical affairs thereby amalgamating these associations accustomed in the past to pursue individualistic courses. Secondly, it centralizes their legislative activity making available the combined judgment and support for the good of all. It will prevent duplication, misunderstanding and individualistic action. This conference records an achievement by your State Society that gives every promise of desired benefits for the health interests of the people as also for our members.

MEDICAL EDUCATION IN FLINT—GENESEE COUNTY

There are several ways by which members of the medical profession in Flint, may receive education in scientific medicine. Consequently with such opportunities afforded, there should be no reason why members of the profession in this city should not keep abreast of medical times.

The Genesee County Medical Society holds semi-motnhly meetings for 10 months during the year. The Program Committee of this society arranges the program to conform to the idea of a post-graduate course in medicine, surgery, and the specialties. The speakers are chosen with special care as to their qualifications, and usually are representatives of the various nearby medical centers.

The Staff of Hurley Hospital meets once a month, throughout the year, and at these meetings the fatal cases of particular interest are presented, and freely discussed, from standpoint of diagnosis and treatment.

Every Sunday morning excepting July and August, the Chief of Medical Service at Hurley Hospital holds a clinical conference lasting two hours, and open to all members of the Hospital Staff. At this meeting any case of interest, in or out of the hospital, is presented by the attending physician or surgeon, and freely discussed from all angles by those present. These meetings have become very popular and are the most instructive of all.

In addition to the above, there are the M. S. M. S. Post-Graduate Conference, the Tri-City Medical Society, the exchange meeting with the neighboring county societies, and the monthly staff meetings of Women's Hospital.

This makes a total of 85 meetings of a scientific medical nature which members of the Genesee County Medical Society may attend.

DISASTER RELIEF

The perfected plan of providing medical relief and service in the event of large disasters resulted from conferences between representatives of the American Medical Association and the American Red Cross. The plan provides for systematized supervised medical relief in contra distinction to disorganized medical care that has characterized this service during the first days following a large disaster.

Under this new plan medical services will be forthcoming from organized teams dispatched to the scene of disaster. The channel of relief will be directed through these avenues: the secretary of the American Medical Association, the secretary of State Societies and the secretary of County Societies. In the event of a call for help the National Officer will receive the call from the Red Cross. He in turn will transmit it to the state concerned and the requisite number of local teams will be ordered to the scene of accident.

The plan entails that each County Medical Society shall organize such a team or teams. These teams should have a commander or head officials and should be composed of surgeons, specialists, internist, clerk, nurses and lay members. The laymen will be utilized to supply food, blankets and quarters for the injured and to establish identification of the injured. If possible a supply depot having blankets, cots and surgical dressings should be established so as to be available for immediate use. Local conditions should surveyed so as to have plans of buildings that can be used for emergency hospitals to supplement the local hospital

accomodations. Available ambulances should also be enlisted. Your local American Legion Post will supply excellent personnel if they be but enlisted. We urge that the organization in your county be promptly perfected.

ESSENTIALS OF AN APPROVED CLINICAL LABORATORY

DEFINITION

A clinical pathologic laboratory is an institution organized for the practical application of one or more of the fundamental sciences by the use of specialized apparatus, equipment and methods, for the purpose of ascertaining the presence, nature, source and progress of disease in the human body.

Only those clinical laboratories in which the space, equipment, finances, management, personnel and records are such as will insure honest, efficient and accurate work may expect to be listed as approved.

LOCATION, HOUSING AND EQUIPMENT

The housing and light should be adequate for the proper functioning of the laboratory. The equipment should be sufficient to permit all essential technical procedures to be properly carried out.

SCOPE

A general clinical laboratory should be prepared to render the following services:

(a) Hematologic. Blood counts, blood groupings and coagulation tests, and tests for blood parasites in general.

(b) Biochemical: Qualitative and quantitative analyses of urine, blood, gastric contents, body fluids, feces, intestinal contents and cerebrospinal fluids; renal and hepatic function tests and basal metabolism.

(c) Bacteriologic: Bacteriologic diagnosis; preparation of vaccines and blood and body fluid cultures.

(d) Serologic: Serologic diagnosis; agglutination, complement fixation, or precipitin and lysis tests.

(e) Pathologic: Preparation of paraffin, celloidin or frozen sections, microscopic and gross pathologic specimens and necropsies.

(f) Parasitologic. Protozoal and zoological diagnoses.

PERSONNEL

(a) The Director.—The Director of an approved clinical laboratory should be a graduate of an acceptable college or university of recognized standing, indicating proper educational attainments. He shall have specialized in clinical pathology, bacteriology, pathology, chemistry, or other allied subject, for at least three years. He must be a man of good standing in his profession.

The director shall be on full time, or have definite hours of attendance, devoting the major part of his time to the supervision of the laboratory work.

The director may make diagnoses only when he is a licensed graduate of medicine, has specialized in clinical pathology for at least three years, is reasonably familiar with the manifestation of disease in the patient, and knows laboratory work sufficiently well to direct and supervise reports.

Where the director is not a licensed physician the laboratory shall issue no reports containing diagnoses and prognoses, unless such diagnoses and prognoses are made and signed by a staff physician having the qualifications specified above for a medical director.

(b) Assistants.—The director may have a corps of qualified assistants and technicians, responsible to him, and for whom he is responsible to carry out promptly, intelligently, and accurately the several kinds of service the laboratory offers. All their reports, not only of tissues but also of all bacteriologic, hematologic, biochemical, serologic and pathologic data, should be made to the director.

REPORTS

An approved clinical laboratory should make its reports through the director. If the director is not a physician, any report making diagnoses or prognoses shall carry also signature of the staff physician, and such reports shall be made solely to the physician in charge of the patient. All blanks for reports and other documents should have the name of the director printed on them, and if of a diagnostic or prognostic character, the name of the staff physician also.

RECORDS

Full records of all examinations made by the laboratory, suitably indexed and filed, are essential. Every specimen analyzed in the laboratory should be given a serial number, which should follow that specimen in the records and reports. When the laboratory report concerns a hospital patient, an exact transcript of the laboratory record should be appended to the hospital case record. Each specimen submitted to the laboratory should have appended pertinent clinical data.

LIBRARY

The laboratory should be provided with, or have convenient access to, a library includiny current scientific books and journals on all the various subjects required in its work.

FEES

There should be no dividing of fees or rebating between the laboratory or its director and any physician, corporate body or group.

PUBLICITY

Publicity of an approved clinical laboratory should be in professional good taste and be limited to statements of fact, as the name, address and telephone number of the laboratory; names and titles of the director and other active, responsible personnel; fields of work covered; office hours; directions for sending specimens, etc., and should not contain misleading statements or claims of unusual superiority. It should not advocate medical fads nor lay undue stress on the importance of laboratory findings.

Only the names of those rendering regular service to the laboratory should appear on letterheads, or any other form of publicity as being connected with the laboratory.

Advertising matter should be directed only to physicians either through bulletins or through recognized technical journals, and never to the nonprofessional public, as, for example, by announcements in popular journals and periodicals, circulars, pamphlets, telephone lists or other means.

The above essentials have been established by the Council on Medical Educations and Hospitals of the American Medical Association. After careful investigation the following Michigan laboratories have been so approved.

Detroit—Detroit Clinical Laboratory, 2033 Park avenue, W. L. Brosius, director; National Pathological Laboratory, David Whitney building, Fred J. Eakins, director; Owen Clinical Laboratory, Stroh building, Robert G. Owen, director.

Grand Rapids—Clinical Pathological Laboratory, 110 East Fulton street, James S. Brotherhood, director; Grand Rapids Clinical Laboratory, Metz building, George L. Bond, director.

Saginaw—Central Laboratory, 302 South Jefferson street, Oliver W. Lohr, director.

IS MEDICINE DRIFTING INTO LAY LAY CONTROL?

The above is the title of an article appearing in October issue of California and Western Medicine by Rexwald Brown, ex-president of the Southern California Medical Society. Brown cites as evidence of lay control the engulfing of large numbers of medical men as employes of life, health and accident insurance companies, departments of sanitation, educational hygiene in public schools, voluntary organizations promoting health movements and clinics, research foundations. Hospitals and medical schools are largely adminstered by lay-boards or trustees. Foundations influence our medical colleges and universities. Social services providing medical care and fostering medical pauperism. All these and many other agencies that employ full-time medical men and subject them to the policies of administrative officers and their lay control. And the author continues:

In the portrayal of these outline facts there is no intent to belittle the efforts being made by sincere and earnest lay men and women toward a healthier and happier world in which to live. But a note which insistently obtrudes itself throughout all these activities is disparagement of the capacities of physicians as thinkers, doers, administrators, and leaders outside the confines of actual medical practice, the personal relationship of physician to the sick patient.

All of which should be our concern else in a few years we will be fighting for our very existence.

What is the answer? Brown goes on to state: "We have permitted ourselves to be walled off from society at large.—Our principles of ethics has imbued the medical mind with conviction that aloofness from matters other than those of personal service to the sick is fundamental to the spirit of the code.—Aloofness has become a despot and has made medical men slaves fearful of the master and fearful of the fellow-slaves."

Only loyalty to our profession withholds our recognition that public opinion toward us is far from endorsement of us and our methods. Scientific medicine must face the fact, however, that the public has lost confidence in us measurably, not alone as regards our inadequacy in health leadership, but even as competent in the management of disease. The responsibility for this condition rests squarely on the shoulders of medical men.

Common sense compels us to admit something is wrong within the structure of organized scientific medicine. We are losing caste, failing to register the worth of our ever mounting knowledge, muffing our opportunities for higher service, and we are in danger of becoming pawns instead of guides in progress. Medical men should be filled with shame that we are unable to acquaint the public with the values our profession can contribute to a growing civilization. Instead we bow our heads to organizations of lay people, as The American Association for Medical Progress, who pitying our poor endeavors, yet believing in us, attempt to do educational work for and in support of us.

Medicine's way to a position of strength in the minds of the people involves a change more profound than informative broadcasting or alterations in the character of pre and actual technical studies. The change must be that of nursing into compelling expression a voice now very weak, which carries, however, the truest note in scientific medicine's structure of service. The highest ideal of medicine is the promotion of individual, community, and national health.

The teaching of the science of medicine needs drastic revision so that a new tide of thought may sweep

through the classrooms of the medical schools. In addition to studies in the science and art of medical practice, new course muse be given inculcating students with knowledge of their high responsibilities as law givers to the people and as teachers of health. Graduates of today tell that during their years of study little or nothing is given them of the history of medicine through the centuries, of the relationship of medicine to life at large, of the forces ever tending to destroy scientific medicine, of the prejudices and ignorance of an indifferent public, of social spheres where the knowledge of the medical man could be useful, and of the worth of medicine in helping to advance civilization. And the subject of medical ethics which looms up so prominently after graduation is given only cursory consideration in most schools. In discussions of medical problems, young physician graduates of outstanding medical colleges have been heard to say that their introduction to ethics consisted of their being handed the Principles of Ethics at or about the time of their graduation.

Medical education in and out of college needs the attention of the members of organized scientific medicine. The errors of the past, the stupidities of our insularity, our failures to impress humankind of our values to them in all the spheres of life call us to an accounting with ourselves. We, the medical profession, must survey, must reinspect our positions in the light of present-day thought, which is throwing aside the hindrances to progress imposed by precedent, custom, and tradition. Where is scientific medicine heading, what is its concern with the vital problems of today, is its knowledge becoming humanized, and is it hearing aloft the emblems of leadership?

We medical men have become rather set in our ways. Consider our weekly, monthly or annual medical gatherings. There are hundreds of them—county, special, state, and national medical society meetings. And what is the general order of procedure in all of them? Over 90 per cent of the time is devoted to the reading and discussion of scientific papers and presentation of clinical material. The worth of an adequate number of such meetings is not decried. They are fundamental to the continuous diffusion among us of the discoveries and experiences in the fields of research and clinical medicine. Teh point is that our increasing familiarity with special fields of knowledge is blinding us to our relationships to life as a whole or is preventing us giving due consideration to our responsibilities in general affairs.

There must be an awakening to new purposes, new duties and expended activities if organized scientific medicine is to be other than a competitor for the management of the sick with the pseudo-scientific and the ignorant and fanatical cultists. We must shatter our attitude of reserve and come out into the open as forceful advocates of the great aim of scientific medicine—the promotion of health.

Health is fundamental to achievement in all spheres of human activity. Scientific medicine should work continuously not only to seek out the laws of health, but also to make these laws operative in a progressive civilization. Scientific medicine, the facts of which are demonstrable and verifiable by observation, experiment and test, needs no defense, but the disciples of medicine who know the facts must learn that it is incumbent upon them to inspire confidence in themselves as expositors of the knowledge.

Through the avenues of the local, state, and national medical societies must scientific medicine enter the arena of large human service. Our attack must be first upon the paralyzing routine of our meetings and upon a complaisant acceptance that our learning is for the elect only. Let us have a new order of procedure—half of each meeting or whole meetings at frequent intervals to be devoted to consideration of the matters immediately related to medical practice as to their effect upon our profession and upon society at large.

AN OUTSTANDING EXAMPLE OF MEDICAL LEADERSHIP

In these meetings we must face the problems which we now ignore and which the public tries to solve with more or less contemptuous disregard of medicine's counsel and guidance. Physicians must develop powers of leadership along all medical fronts. The wider biologic knowledge possessed by physicians as a class enables them better than others to formulate the policies which pertain to municipal and national health and sanitation, to educational hygiene, to medical economics, to hospital management, to social service, to medical education, and to the propagation of a virile race.

The policies formulated, medical men through intensive, associate effort must be the powers which introduce and influence acceptance of the policies in the life of the world. Is there any reason why we cannot be initiators, administrators and executives in our own fields as business men, financiers, engineers and others are in theirs?

To say that we cannot is to forget that in the science of medicine there looms forth a figure of unparalleled administrative genius, Dr. W. G. Gorgas, whose life should ever stimulate us to the continued insistence that the public should adopt those scientific measures which create health. Doctor Gorgas, an executive and compelling force in the domain of medicine was the man who made it possible to build the Panama Canal. And until he became acclaimed the world over for his tremendous achievement he was assailed and derided, and his work was interfered with by the lay control in charge of the general administrative business and engineering conduct of the building of the canal. Noted lay executives and big men of affairs called him a stupid doctor with nonsensical ideas. Yet business acumen and engineering skill would have failed entirely in putting through the canal without the underlying medical knowledge made effective by a capable medical administrator.

Organized scientific medicine must make itself a dynamic force, respected and honored as basic to all progress. This is medicine's greatest responsibility. Medical men must take the offensive and convince humankind of the wealth of resources in medical science. The worth of the profession should be so splendidly revealed by the labors of physicians that great warmth of respect and support will always be conceded by the public. The place of medical science in the esteem and confidence of the lay mind should be so high that philanthropists would never hesitate to assist financially in the efforts made by the profession to better living conditions and alleviate suffering.

Medical men should make it obligatory upon themselves to render strict business accountings for the management of public service institutions and other trusts, but the politics directing the expenditures should not be dictated from without the circle of medicine. The rules governing clinical practice, medical research and the management of medicine's activities should emanate from within the profession and not from the lay public, whose efforts are so often dictated by business experience.

Scientific medicine is a profession whose evolution began as Osler has said in that wonderful Grecian era when Hoppocrates lived and received his inspirations from the spirit of the times which asked of all measures, "Do they make like a better thing?" Business asks, "Do these measures produce a profit or make expenditures and income balance?"

A cloak of mystery has far too long been wrapped about the science of medicine. The disciples must tear it aside. The public must be taught that physicians are not in league with occult forces, that medical knowledge, like all other scientific knowledge, is subject to the laws of verifiable fact, that medical knowledge is not divisible into sects, and that no knowledge is of more worth than that which conduces to self-preservation and the continuance of the race.

A DOCTOR'S MEMORIES

The delightful and informing record of a long, active and useful life. For nearly half a century Dr. Vaughan has been a leading figure among the physicians of this country. As Dean of the University of Michigan Medical school he built up that great institution to its present importance. He is our greatest authority on epidemics. His work on the commissions that investigated the typhoid epidemic during the Spanish War and the flu pneumonia epidemic during the World War was of enormous value. He has been president of the Association of American Physicians and the American Medical Association, and is chairman of the division of medical sciences of the National Research Council.

In this chatty and charming auto-biography he tells of days in northern Missouri before the Civil War, of his education and his work as an educator; of the many men and women prominent in the world of science and culture and war and politics with whom he was brought in contact; of the life of a practising physician; and the experiences of a medical expert on the witness stand. His interests are wide, his judgments sharp and just, his fund of anecdote lavish.

Dr. Vaughan has had the eye to see the world he crossed in his busy life, and the pen to tell what he saw. His story is pleasing, interesting, informing, accurate. It has scientific, educational, personal and historic value.

American men of medicine pass steadily before a mirror in an unbroken procession for 50 years. And he is interested not only in physicians, but in all figures of the scientific world. He considered Eliot of Harvard, White of Cornell, and Angell of Michigan the three greatest college presidents of their day. His comments upon James Bryce, Sir Frederick Pollock, Francis Hopkinson Smith, Joseph Jefferson, Wu Ting Fang, Theodore Roosevelt and Woodrow Wilson as college visitors are kindly, keen and unique. The account of his studies under Koch and Frankel, Roux and Pasteur, holds decided interest. His estimate of Pasteur and his criticism of Koch's bad manners seem equally sharp and just. He heard Canon Farrar preach, surprised Dr. Abraham Jacobi in his garden, voted for Horace Greeley and was in a yellow fever epidemic as early as 1888. He has the same joy in telling jokes on himself, in poking fun at fraud and superstition, recounting medical procedure, describing the uniform of Roosevelt and the bed slippers of Bryce.

His Spanish War experience brought him close to Walter Reed and Gorgas; his World War experience put him in touch with Gorgas again, with Braisted, Blue, Martin, Welch, Simpson and Grayson.

There is an element of greatness in a doctor's memories that makes it catch at the imagination and the heart.

The above is but a hurried comment upon a book that interested us by it's fascination, coming as it does from one who was one of us, our ex-president and friend. We feel quite sure that those who knew Vaughan will be keen to read this auto-biography that is tempered by the calm reflections influenced by the afternoon of life. We of Michigan take pride in the achievements of him who did much to enable us to attain our present position in the medical and organizational world.

Editorial Comments

The following from the *Wayne County Bulletin* imparts additional reasons for the high cost of sickness. We do not blame the nurses—we do not blame hospitals for making it necessary to employ so large a number of nurses because of inadequate hospital nursing care. In desperately ill patients, a special nurse is required and she earns her $7 to $9 per day. The average appendectomy or laparotomy does not require a special nurse, whose efforts consist mainly of giving a morning bath and arranging the flowers. Hospital tendencies toward an undermaned nursing staff causes the continuation of a demand for special nurses for normal cases.

At the last meeting of the Detroit District of the Michigan State Nurses Association, held Oct. 1, 1926, it was voted to raise the rates for Private Duty Nursing $1 per day. This raise is to become effective Nov. 1, 1926. Rates will be as follows:

General cases—$7 per day for 12 hours.
General cases—$8 per day for 20 hours.
Obstetrical cases—$8 per day for 12 hours.
Obstetrical cases—$9 per day for 20 hours.

Communicable, such as scarlet fever, diphtheria, smallpox, erysipelas—$8 per day for 12 hours; $9 per day for 20 hours.

Multiple nursing in hospitals, two patients—$4.50 per day for each patient.

Multiple nursing in hospitals, three patients—$3.33 1-3 per day for each patient.

The following from the Michigan Daily imparts the high points of the adresses of President Little and Dean Cabot at the dinner given in connection with the Ann Arbor Clinic.

"Michigan can and will have one of the great medical schools of the world, if the cornerstones of modern research are laid here in the immediate future." In these closing words President Clarence Cook Little finished his plea for increased co-operation between the Medical school of the University and the practitioners of the state before the banquet of the Michigan Medical society last night in the main dining room of the Union.

The meeting being held in Ann Arbor the last three days of this week is the first annual graduate clinic of the University. President Little dedicated his speech to the project of making the Medical school outstanding through achievements in the specialized lines of endeavor.

The first reason which he gave for his faith in the undertaking was that the University was now in possession of the greatest teaching hospital in the country. He complimented the medical faculty as being a group of men who have left the stamp of their individuality upon thousands of graduates. Carrying on, he said that one of the essentials of greatness was the continuation of the present system whereby each of the counties sends its quota of patients to the hospital for special treatment. "The weak arm of the service at the present," he said, "is our lack of special units for the carrying on of this class of work. The Simpson Memorial Institute for Medical Research is an example of what is needed. It has been opened but recently and will later especially do work in the field of pernicious anaemia. Provision of housing conditions for tuberculosis patients would create and insure research in that line. Cancer, another one of the unconquered maladies for which there is at present in the state no separate department or hospital, should also receive attention. There are now in the hospital too many convalescent children who are taking up expensive time and room. They should have their own institution where educational facilities could be incorporated along with medical attention. Such a place would serve as a model for other communities who desire something in that line."

"Radio-active substances," he continued, "have handed to the profession the greatest power in years and at present we do not know properly the dosage of them. This is the place where such problems should be worked out. Research in radio-therapy is a great cornerstone in medicine, and schools which feature and develop it will become the greatest in the country."

Hugh Cabot, dean of the Medical school, criticized the present method whereby a student receives too much teaching during his first three years in the Medical school and not enough of actual common experience. He said that even the training received in the University hospital was of such a specialized nature as to leap over the fundamentals. Speaking on the subject "Where Do We Go From Here?" Dean Cabot said, "A clear problem faces the profession today because of the immense increase in the amount of basic knowledge. The effect is a strengthening of the basic sciences in the schools but the keeping of the student from seeing his goal. Graduates should be left with a better orientation. This can be accomplished by bringing men of broader practical experience to the hospital, who can improve themselves at the same time, and by sending students out for monthly periods with state practitioners and hospitals. Some form of the old apprentice system should be restored."

Armistice Day is passed and the World's War has been terminated for eight years. It's aftermath is still manifest, even though financiers and diplomats stress the debt feature. A spirit of resentment was rekindled by the following poem of Kipling:

THE VINEYARD

By Rudyard Kipling

(Referring to America's part in the World War)

At the eleventh hour he came,
But his wages were the same
As ours who all day long had trod
The winepress of the wrath of God.

Since his back had felt no load,
Virtue still in him abode;
So he swiftly made his own
Those lost spoils we had not won.

We went home, delivered thence,
Grudging him no recompense,
Till he portioned praise or blame
To our works before he came.

Till he showed us for our good—
Deaf to mirth and blind to scorn—
How we might have best withstood
Burdens that he had not borne!

Yes, it sure did stir everyone to resentment. We are glad of the following answer:

THE ANSWER

(To Rudyard Kipling)

At your eleventh hour of blood and flame
We gave your answer to a thankless call
By setting our backs with yours against the wall—
Paid with your shameless, small black words of blame,
True coinage of the ingrate, after all!

But let us build no more, in bickering rhyme,
Old, sick mendacities of Use and Time,
Nor with safe words our little hatreds wreak,
Skulking beneath the Literary Lie!
Only the unspeaking Dead have right to speak—
Unless to live, through such times, is to die!

Youth, born for life and song, we urged embark
Down to the songless, grim, unpitying Dark;
While in sure traps their shortened days were caught
We sang their battles, but we never fought!
Then, that such deaths of slaughtered youth may cease,
In Life's great name, let us make songs of peace!

—Harry Kemp.

Rock, studying the records of the Boston Lying in Hospital reports in the Boston Medical and Surgical Journal the following conclusions:

Most spontaneous miscarriages in man, as in lower animals, are caused by intrinsic disturbances in the fertilized ovum, or in the maternal organism, and not by the traditional extrinsic environmental accidents to the mother.

The causes of sterility and of miscarriage are probably, in large part, identical, the two conditions be-

ing, as Macomber and Reynolds have taught, but different degrees of diminished fertility. Causes of miscarriage should be studied in fine detail, which includes careful examination of both parents as well as the products of conception.

Diagnosis of miscarriage is usually easy. The important difficulty comes in discriminating between a merely threatened, and an inevitable miscarriage. Various criteria for judgment are given above.

The treatment of threatened miscarriage is deterrent. That for inevitable and incomplete miscarriage is provocative. Many authorities with their statistics are quoted—some advise great conservatism in treatment; others, extremely aggressive procedures. Analysis of 131 cases at the Boston Lying-In Hospital shows good results from a routine which permits conservative treatment of the case which is progressing properly by itself, and interference, before trouble is reached, in cases which are not progressing in the right direction. A septic uterus, except in cases of active and severe haemorrhage, should not be invaded.

Welz draws the following conclusions after a study of Caesarean sections performed in Detroit hospitals:

1. Abdominal caesarean section is performed too frequently.
2. Maternal mortality resulting from abdominal Caesarean section is too high.
3. Infantile mortality resulting from this operation is too high.
4. These bad results come from ignorance in the practice of obstetrics.
5. In order to improve these results the practice of obstetrics must be placed on a higher plane.
6. Each hospital must be held accountable to the public for the character of obstetrics done in it.
7. Each hospital must place safeguards against ill-advised obstetric operations, including abdominal sections.
8. The medical profession must understand the dangers of, as well as contra indications to, abdominal Caesarean section.
9. The public should be instructed that delivery through the natural birth passage is safer and better for mother and child.

We join in this warning and add that in many so called contracted pelves normal delivery can be accomplished. Those doing obstetrics may well review their records as to results. There is a tendency toward too frequent interference, middlesomeness and eagerness to resort to surgical proceedures. Give the patient time, women in labor have not yet attained the speed mania.

We concur in President Little's comment as to the direction along which our University Hospital and Medical school should expend effort. As Regent Sawyer stated, Post-Graduate courses must be forthcoming and if a new faculty is needed it should be created. We have contended for such a school for several years—a school where a doctor may go, spending a few days at short intervals but pursuing a definite course during the year. Opportunity also for a week, a month or several months of work, commulative in type and leading to definite ends. We are quite certain that the demand for such opportunities will be impressive just as soon as the announcement of the establishment of such a Post-Graduate school is made. Doctors perceive and feel the need of such a school. Michigan should meet that want and need. The Council's Committee will have a report upon this subject ready for submission at the January meeting.

Thoughts while visiting about: Doctor on train sounding off to group in smoking room on merits of the Stienach operation. Doctor's reception room revealing rare specimens of antique furniture—broken. Table littered with year old, dirty magazines, dust in corners. Doctor's desk a mass of pills, bottles, circulars, cigar stub, unopened journals and a dirty blotter. Bottles of urine in medicine closet. Soiled dressings and cotton in open waste basket. Speculums and female treatment instruments on window sill. Dirty pillow on examining table. This in contrast with a most modern, well-kept, neatly furnished offices of another doctor just across the street. A group of rooms labeled "Clinic." A registration desk where patients civic data is obtained as also fees. A lot of record cards supposedly containing histories but the recorder could never qualify in a history department—it's an art. Everybody from colored maid to chief robed in white—gowns are great concealors of physical anomalies. Odor of ozone from sputtering vibrators, diathermy and "lights" at so much per treatment and rare is the case that doesn't need some form of light or electric treatment—if properly farmed. Absence of array of cathartic pills—evidently they are *passe*—the thought persists from the old days that a good bowel movement often still achieves results. A suggestion for Clinics is a Dietary department to give much needed instructions as to how and what to eat. Oh well, sometimes we hope a new lay organization will be formed devoting its efforts to reforming doctors reception and consultation rooms. In the mean time you might call in the local painter, furniture and carpet men and spruce up your old dump. Office girls chewing gum, answering phone loud enough so all in hearing may know that the doctor is still at the hospital operating, or is in Athens in consultation, or is called to see Oudini. A manual on "office girl's" imparting advice on style, technic and effective methods should be forthcoming from a facile pen. A substitute picture for that of "The Doctor" should displace this time worn wall adorment of pristine glory. So too the advertising clock stating "The Doctor Is Out, Will Return At —" Guess these are sufficient thoughts for this time—hope they make some think and act—in the meantime hang up the holly wreath and try and get a Merry Christmas without too many socks, ties and 'kerchiefs and more paid up bills from dilatory patients.

Each issue of The Journal contains a department devoted to the work of our State Department of Health. The articles contained therein are not "fillers." They reflect the activity of our health officials and summarize the work, experiences and opinions of these experts. As such they convey reliable advice, that is of value to every doctor. In this issue you will find a discussion of particularly interesting topics. In addition, service that is available to you is enumerated. We direct your attention to this department urging that you utilize the information imparted in your daily practice.

We have no difference with Christian Science as a religion or as a moral censor. We do differ and resent the endeavors of this creed to extend its claims into the physical realm and decrying proven science, belie their assumed name, holding forth that there is no such a thing as disease. The blind spot in their mental eye and the narrowed position in spite of irrefutable facts has caused the loss of many a life—far greater than that occasioned by any war. And yet these propogandists continue their questionable methods to hoodwink the unthinking—but they're slipping and with a little more public education they will slip with a plunk.

Elsewhere you will find the report of the University Clinic. Read it. If you were not present you missed a real opportunity. Don't miss the next one.

Chicago is planning to celebrate its hundreth anniversary in 1933. An exposition is to centralize the event. It is announced that one unit of the exposition will be a temple of medicine embracing nine buildings costing $25,000,000. After the centennial these will be converted into a 4,800 bed hospital with every facility for research, post-graduate study and world education in health. The hospital to be managed by Chicago, Ill., Northwestern and Loyola Universities. This announcement provides food for reflection—ponder upon the influence such a hospital will wield.

The Maimonides Medical Society of Detroit has resumed the publication of its Bulletin under the editorship of Dr. N. E. Aronstam. Volume 3 No. 1, consists of 18 pages and cover, with timely announcements, program, personals and ads. Society Bulletins are to be encouraged while at the same time advice is tendered that the value of its reading contents increases with the omitting of clipped material. We shall watch this Bulletin with interest and tender our congratulations on it's resumption of publication. In addition to its objects of organization the society must not be unmindful of an added obligation to support the activities and purposes of the Wayne County Medical Society.

Hygeia—How are you aiding in causing an increased circulation in your community? The following letter points out the way:

November 16, 1926.

Secretary Michigan State
Medical Society,

Calhoun County Medical Society has just completed arrangements for placing a copy of "Hygeia" in every schoolroom in Calhoun County for the remainder of the school year at the society's expense. Note of this in the State Journal may stimulate action in other localities.

Sincerely,

Dr. C .S. Gorsline,
Chairman Committee in Charge.

Among Our Letters

NOTE—*This department is the open forum of our members. Your communications and discussions are welcomed. Anonymous communications cannot be accepted, though at times names may be omitted by the Editor. Personalities will not be printed and responsibility for opinions is not assumed. We invite your interest in this department. Address: The Editor, Journal, Michigan State Medical Society, Suite 1508, Grand Rapids National Bank Bldg, Grand Rapids, Mich.*

Editor of The Journal:

Beginning with the January issue The Radiological Review will be published monthly instead of bi-monthly and it will increase its number of pages from 32 to 64.

As you know, this is the only journal devoted to the progress of X-ray and Radium from the standpoint of the general practitioner and the specialist in branches other than Radiology.

We would appreciate a mention of this extended program for 1927 in your columns.

Thanking you for this co-operation, we are

Sincerely,

Radiological Review Publishing Co.
Robert H. Herrick,
Business Manager.

Editor of The Journal:

I have your letter of the 13th inst., regarding the appointments on committee to investigate charity services in the Michigan hospitals. I shall be pleased to accept this appointment.

Very truly yours,

W. M. Marshall,

FROM A NINETY-TWO-YEAR DOCTOR

Pitt S. Wilson, M. D., Secretary.

Muskegon, Mich.
Sept. 27, 1926.

Editor of The Journal:

I am in receipt of your favor of the 25th inst. informing me that at the State Medical Society meeting held at Lansing I was elected an Honorary Member of the Michigan State Medical Society.

May I, by your kindness, extend to the members of the State Medical Society my sincere thanks for their kindly thought of me and to say to them that I appreciate in no small degree that signal honor they have conferred by thus making me again a member of an association in which for nearly a quarter of a century I bore a humble part, becoming first identified with it in 1869 or 70, continuing my active membership till I changed my residence from Michigan to that in Florida.

Though I gave up the practice of my profession over 20 years ago I have never lost my interest in, or my love for "The Healing Art," and I would esteem it a rare privilege ,if the infirmities of age permitted to meet with you while in session.

At the age of nearly 92, I feel that I am in some measure a "left over" from a past age—a representative of a bygone generation. Since my retirement the science and practice of medicine and surgery have made most wonderful advancement, so that today most any man in my situation may well wonder just "where he is at."

Again thanking you for the honor you have conferred, and with all best wishes for each of you.

I am most sincerely, your associate,

John P. Stoddard, M. D.,

State News Notes

Dr. A. J. Warren of Mt. Clemens is up north on his annual venison hunt.

Dr. F. E. Thompson was re-elected chief of staff of St. Joseph, Mercy Hospital.

Dr. G. G. Roberson of Utica is recovering from a

gall bladder operation at St. Joseph's Hospital Mt. Clemens.

Dr. B. F. Green of Hillsdale attended the Montreal session of the College of Surgeons.

Dr. George L. LeFevre has been elected a trustee of the Muskegon County Sanatorium.

Dr. U. V. Portman of Cleveland addressed the Kent County Medical Society on Nov. 10.

The annual conference of secretaries, presidents and editors of State Societies will be held at the A. M. A. headquarters, Chicago on Nov. 19 and 20.

A free clinic for heart, tuberculosis and eye, ear, nose and throat has been opened by the Port Huron Health Department.

Dr. F. H. Bartlett of Pontiac has been appointed director of the Muskegon County Tuberculosis Sanatorium.

St. Mary's Hospital, Grand Rapids, opened its new addition on Oct. 15. New operating rooms, laboratories, maternity, wards and private rooms are provided for in a most modern manner.

The Executive Committee of the Council will meet with section officers on Dec. 9 at 6:30 p. m., Grand Rapids. The nature of our program for the 1927 meeting will be determined.

The Highland Park Hospital Detroit will hold an all day clinic on December 2. A banquet in the evening will be addressed by invited clinicians. Our members are invited.

"Word has been received from the Dermatological Research Laboratories that they appreciate the patronage given to the D. R. L. Arsphenamines by physicians in this state.

"These products have been advertised in this Journal for some time and it is gratifying to know that the readers have taken cognizance of the support of the advertisers. Also, that they are aware of the quality, safety and therapeutic efficiency of the Dermatological remedies for syphilis, which were the first to be made in this country and supplied to the physicians of America when the world war was in progress."

In recognition of his long service to the people of Battle Creek Dr. W. L. Godfrey was presented with a silver loving cup on his fiftieth anniversary as a practicing physician at the meeting of the Calhoun Medical Society in the Post Tavern. Dr. W. H. Haughey, a life long friend of Dr. Godfrey, made the presentation address.

In his talk Dr. Haughey told of having begun his own practice here in April 1888 and met Dr. Godfrey who already had won repute as a physician though he was still one of the younger doctors in the city at that time, having been practicing but 12 years. Dr. Haughey brought out the differences in the methods of practice then and now and the greater opportunities at that time to become acquainted with the real skill of associate physicians.

Modern methods of examinations such as X-ray photographs have practically meant the end of the older methods of holding consultations over a patient, Dr. Haughey said. "In earlier times a young doctor would call in an older physician on a case to pass approval on the work if only to satisfy the patient that his case was being handled in the proper way. As a young doctor I called on Dr. Godfrey many times as a consultant . In this manner Dr. Godfrey and I became fast friends."

Dr. Haughey concluded by citing many instances of long trips he had taken with Dr. Godfrey to meetings and conventions of medical men in all parts of the country. He told of having met Dr. Godfrey away from this city on other occasions at sessions of physicians where they had always talked and recounted their experiences.

Twenty-five members of the Society of Oral and Plastic Surgeons attended the clinic given by Dr. Chalmers Lyons at the University Hospital on Thursday, Nov. 11. The surgery of cleft palate and hare lip was demonstrated on this occasion.

They arrived in Grand Rapids on Friday morning and were given an operative clinic by Dr. Ferris N. Smith on Friday afternoon and Saturday morning. This surgery embraced many phases of intra-oral and facial reconstructive sugery.

There was a radical operation for a mucocele of the maxillary antrum, the repair of a traumatic saddle nose, the repair of a syphilitic saddle, using rib cartilage, removal of a large, mixed tumor of the soft palate, the repair of two cases of marked contracture of the neck, following burns. One was repaired with a tubed pedicle flap from the arm and the other with a free full thickness graft, with pressure dressing. Reconstruction of the mouth, following surgical contraction (carcinoma), the recovering of an upper arm with a pedicled flap, after removal of a hairy, melanotic nevus. The construction of an upper lip, following previous removal of carcinoma, a total reconstruction of the nose following removal for carcinoma, and the return of a forehead pedicle after reconstruction of a total nose.

On Saturday afternoon there was an academic session for discussion of plastic problems, and presentation of numerous patients showing all types of plastic reconstruction.

The visitors were as follows:

Dr. William Shearer—University of Nebraska, Omaha.

Dr. Claire Straith—Detroit, Mich.

Dr. S. L. McCurdy—Pittsburgh, Pa.

Dr. V. H. Kazanjian—Plastic Surgeon, Harvard University, Boston, Mass.

Dr. F. A. Figi—Mayo Clinic, Rochester, Minn.

Dr. L. M. S. Miner—Dean of Dental and Oral Surgery, Harvard University, Boston, Mass.

Dr. Harold Vaughn—Professor of Oral Surgery, Post-Graduate Hospital, New York.

Dr. Chalmers J. Lyons—Professor of Oral Surgery, University of Michigan, Ann Arbor.

Dr. Vilray P. Blair—Professor of Oral and Plastic Surgery, Washington University, St. Louis, Mo.

Dr. Fulton Risdon—Toronto, Ontario.

Dr. L. Schultz—Chicago, Ill.

Dr. H. S. Dunning—Professor of Oral Surgery, Columbia University, New York.

Dr. J. Eastman Sheehan—Professor of Plastic Surgery, Post-Graduate Hospital, New York.

Dr. Robert H. Ivy—Professor of Oral and Plastic Surgery, University of Pennsylvania, Philadelphia, Pa.

Dr. George M. Dorrance—University of Pennsylvania, Philadelphia, Pa.

Dr. F. B. Moorehead—Professor of Oral and Dental Surgery, Chicago, Ill.

Dr. M. I. Schamberg—New York City.

Dr. William H. G. Logan—Chicago, Ill.

Dr. Thomas L. Gilmer—Professor of Oral Surgery, Chicago, Ill.

Dr. Carl Waldron—Minneapolis, Minn.

A dinner to Colonel Angus McLean was given by the Faculty of the Detroit College of Medicine and Surgery at the Detroit Athletic club, Tuesday evening Oct. 19, 1926, on the occasion of the completion of 40 years active medical practice.

Invitations were sent to many physicians throughout the state and to foreign countries. Over 500 guests attended the dinner representing persons prominent in medical and social circles. Telegrams and cablegrams of congratulations were received by Dr. McLean from all parts of the United States and the world.

Messages and greetings were received from Sir Anthony Bowlby, London, England; Professor John C. Fraser, Edinburgh, Scotland; General Robert Duplessis, Dijon, France; Mr. M. Baudard, Prefect Cote D'Or, Dijon, France; Dr. Samuel Berger, Deaconess Hospital, Paris, France; Colonel Ermano Pazzi, Rome, Italy; Sir Berkeley Moynihan, Leeds, England; Dr. P. J. B. LeBlanc, Fairbanks, Alaska; Major A. H. Eber, Phillipine Islands; Dr. Edward Fish, Chee Fow, China; Dr. John R. Hardstaff, Australia; Dr. Harry Boyes, Tripoli, Syria; Dr. Arthur Tyler, Honolulu, Hawaii; Mr. Louis W. Haskell, Algiers, Africa; Professor Wilkie, Edinburgh, Scotland; Sir William Wheeler, Dublin, Ireland; Professor Edgard Furz, Brussels, Germany; Professor R. deJosselin deJong, Utrecht, Holland; Dr. Edward W. Archibald, Montreal; Professor Charles F. Martin, Dean of McGill University, Montreal; Dr. W. W. Chipman, President of American College of Surgeons, Montreal; Dr. Roscoe R. Graham, Toronto, Ontario; Dr. Robert E. McKechnie, Major General Merritt Ireland, U. S. Army, Washington, D. C.; Colonel Jefferson R. Kean, Washington, D. C.; Brigadier-General Walter D. McGaw, Washington, D. C.; Colonel Joseph F. Siler, Washington, D. C.; Admiral Edward R. Stitt, U. S. Navy, Washington, D. C.; Admiral C. T. Grayson, U. S. Navy, Washington, D. C.; Captain Robert Kennedy, U. S. Navy, Washington, D. C. Colonel Allan McGlaughlin, U. S. Health Service, Washington, D. C.; Dr. Searle Harris, Bimingham, Alabama; Dr. Graham E. Henson, Jacksonville, Florida; Dr. H. H. Scanlon, Iowa City, Iowa; Dr. James K. Smith, Texarkanna, Texas; Dr. George H. Evans, San Francisco, Cal.; Dr. Willard Stone, Pasadena, Cal.; Dr. Angus Kenney, Vancouver, B. C. Many doctors were present from Ohio, Kansas, Missouri, California and New York.

The toastmaster of the evening was Dr. James W. Inches. Among the speakers were: Dr. Andrew P. Biddle, Detroit; Dr. Don M. Campbell, Detroit; Dr. Hugh Cabot, Ann Arbor; Hon. John W. Smith, mayor of the city of Detroit; General Francis A. Winter, Washington, D. C.; Dr. Franklin H. Martin, Chicago, Ill.; Hon. Alfred J. Murphy, Detroit; Dr. Walter H. Sawyer, Regent University of Michigan; Allen Campbell, president of Board of Education, city of Detroit; Governor-Elect Fred W. Green, Ionia, Mich.

Congratulations and greetings for the anniversary were received from the Mayo, Crile, Searle Harris and other pominent clinics as well as fom the following hospitals: Highland Park Hospital, Providence Hospital, St. Joseph's Mercy Hospital, Evangelical Deaconess Hospital, St. Mary's Hospital, Grace Hospital, Wyandotte General Hospital, Detroit Welfare Commission-Receiving Hospital, Woman's Hospital, Shurly Hospital. All of which Dr. McLean has been directly or indirectly associated with. Congratulations were also received from Regan-Lide Post of Detroit and State Department of the American Legion.

After Dr. Franklin H. Martin's address on Research in which he expressed hope that the city of Detroit establish a Detroit Research Laboratory in connection with the Detroit College of Medicine and Surgery, which was also recommended by Mayor John W. Smith there were spontaneous contributions. Mr. Robert Oakman gave $50,000 half on condition that oral surgery be specialized; $25,000 by Colonel Edwin S. George and $10,000 by Base Hospital No. 17

A corporated foundation with a board of trustees to be appointed by the mayor is now being organized, the matter will then proceed. Several small contributions have been received since the first contributions were made.

A portrait of Dr. Angus McLean was presented by Mayor John W. Smith and accepted by Allan Campbell to be placed in the Detroit College of Medicine and Surgery. A large handsome bronze loving cup was given to Dr. McLean, which was presented by Governor-Elect Fred W. Green. The cup is embellished with silver and lined with gold, very beautifully inscribed: To Angus McLean, Physician, Surgeon, Research Worker, Soldier, Teacher and Gentleman, from his Friends on the Occasion of the Completion of 40 Years Active Medical Practice, October 19th, 1926.

TO DR. ANGUS McLEAN

By Anne Campbell

Oh, who can count the sick rooms he has brightened,
The many times he's calmed our tragic fears;
And who can tell the weary hearts he's lightened,
In forty years!

The bodies he has healed, the limbs he's strengthened,
The footsteps he has stayed from other spheres,
The minds that he has cleared, where shadows lengthened,
In forty years!

The pain that left upon his skill unfailing,
The old, who at his coming dried their tears,
The babies, at his touch, who stopped their wailing,
In forty years!

The record of his goodness is a treasure
That in the angel's Book of Life appears.
It's something that we humans could not measure
In forty years!

God bless and keep him in his high endeavor!
For him the hand of fellowship that cheers,
And joys so fine that they will fail him never
In forty years!

OUR SOCIETY BUSINESS AND ACTIVITIES

HARVEY GEORGE SMITH
EXECUTIVE SECRETARY

NOTE: **This Department will each month contain a discussion and report of our Society work and planned activities. Your interest and correspondence as to your problems is solicited.**

BUSINESS ADMINISTRATION

The organization and business side of a County Medical Society are most important but of all activities these receive the least attention with most county organizations. This situation is, of course, the opposite of that found in business, industry, education and commerce. Organization is first established by industry before a cent can be spent. This shows where emphasis is placed by business. Without organization no superintendent or business manager could report progress. All recognize the fact that success must come through upward steps correlated and interlated so that the ultimate result at the end of each year is a measure of recorded accomplishment.

Before business attempts to enter any enterprise, there are long sessions of boards of directors, committee meetings with superintendents, reports, surveys, statistics. studies, analyses for the sole purpose of determining whether or not success can be attained and finally what steps and methods must be followed to insure a tangible result.

Contrast the plans and methods of business with that followed by a large per cent of County Medical Societies. The scientific programs are arranged with in a few days of the date of meetings. No special committee systematically studies the work ahead as does that one of business. There is little corelation unless by chance it has come. No study is established on the problems that face every society in its relationships to the community, the city, the county such problems as health education, physical examinations of school children, health status and its relation to business successes, charity and health, food and ill health, the county nurse and the medical profession and other similar problems.

The time has come for Medical Societies to cast overboard old processes and old methods. To make the business organization the major activity upon which all activities may be established. Officers should call special meeting for the one purpose of establishing a business regime which will net results and progress for each society. Until organization is established the years will pass on as of old with no special attainment, no true satisfaction on the part of members or officers and no standing of usefulness in the community. Nothing can be done until the membership appreciates the value of this change of attitude. A president of one society said recently, "the business basis is the most important part of our organization but as soon as the business activities are presented for discussion, the members rush for their offices." This month is the end of another year. Let it take with it as it passes on into history indifference to organization and methods. Begin the new year with organization, directed to solve problems and secure for the society, the membership and the community tangible results.

THE DOCTOR, THE HEALTH EDUCATOR

We have been doing a heap of talking about health education for the public—schools, Parent-Teacher associations, Luncheon Clubs, Womens Clubs in fact every unit of society. Lectures and discussions have been advocated are advocated and will always be advocated as valuable methods in giving information. In fact during the past year more than a hundred thousand people in Michigan have listened to lectures on health. There are thousands of others who have a smattering knowledge of the nature and value of Scientific Medicine. There are confirmed believers and there are those who make up a large group—the unbelievers. This latter group is still worried with the fears of the "black cat that crosses the homeward way." "the 13 guests at the dinner table," "the broken mirror," the "three lighted cigarets with one match," and endless numbers of other old fettishes. The task of discarding the old in manner and habit of life even in this civilized age is accompanied with the fear that the discard may have been made too early.

Fears are accompanied with lack of understanding, with lack of knowledge. Established facts are the opposing factors to so-

cialized and individual fears. They directly affect the community and the individual. Science deals with facts and the establishment of facts. Sciences advance, fears retard and maintain the primitive.

In the field of Scientific Medicine no one is more able or occupies a more influencing position in the establishment of facts than does the doctor. Daily he comes in contact with his patients, daily he has the opportunity to leave one vital fact with each patient. Daily he may demonstrate the established facts of his science. Daily he relieves the ill and councils the well. No better opportunity in education can be discovered than that which comes to the doctor. No better method in teaching has been established than that of interview and discussion, one person with another. We visit our intimate friends for council and advice, for information and instruction and we return to our bailiwick vitalised with knowledge, new enthusiasm and new accomplishments.

You, the 3,000 members of the Michigan State Medical Society become the true educators for your patients by establishing facts and dispelling fears and superstitions.

A COUNTY SOCIETY CALENDER

County medical Societies by virtue of the position they occupy are obligated to conduct an extensive program of activity which directly affects the membership of the Societies and indirectly the community. In order that the obligation of each society may be met and accomplishment recorded it is recommended that societies consider the activities and plans of work herewith attached, which cover the activities in the scientific field, physical examinations, public health education, and social and non-scientific activities for a period of one year.

COUNTY SOCIETY PROGRAMS AND ACTIVITIES

Scientific Section

Meetings and Subjects by Month

December—Pneumonia.
January—Obstetrics and Gynecology.
February—Infectious Diseases.
March—Fractures.
April—Pediatrics.
May—Cardio—Renal Diseases.
June—Gastro—Intestinal Diseases.
July—Vacation.
August—Vacation.
September—The Year's Progress in Medicine, Surgery, Obstetrics, Gynecology, Infectious Diseases.
October—Therapeutics, Drugs, Light, Diathermy, etc.
November—Eye, Ear, Nose and Throat Infections.

Physical Examination Section

January—Physical Examination month for all members.

Section in Public Health Education

1. Lectures in High Schools

January—Health Habits.
February—Our Daily Foods.
March—Pasteur.
April—Lister.
May—Accidents and First Aid. At Home and on Vacations.

2. Parent-Teachers Association and Women's Clubs

December—.....
January—Vitamines and Nutrition.
February—Pasteur.
October—Mental and Physical Health Habits.

3. Luncheon Clubs

January—Science—Basic.
February—Comparative Investments in the Sciences and Relationship to Progress.
March—The Individual Assets and Values.

Social and Informal Activities for Medical Professions

September or October—Smoker and Mixer.
July or August—Picnic. Featuring Golf Baseball, Quoits, Swimming, etc. and Beefsteak Roasts.

For and with Other Professions

April—Ministers, Educators, Nurses, Social Workers. Subject—Problem Cases.
February—Meeting with the Bar Associations. Subject—Crime. Where the Law and Science Co-ordinates.

Deaths

Dr. F. M. Gowdy of St. Joseph, Mich. died Nov. 12, 1926, after an illness of several months. He was 58 years old. Dr. Gowdy graduated from the University of Michigan in 1891 and returned to St. Joseph to practice. At the time of his death he was a member of the state board of health and an officer of the U. S. Army Medical Reserve Corps of the U. S. Army, in which he served during the World war. He was also a member of the Berrien County Medical Society and the Michigan State Medical Society.

Dr. James A. DeVore, 421 Clancy avenue, NE., Grand Rapids, died Friday Nov. 5. Dr. DeVore for the past 25 years conducted the DeVore Hospital and Sanatarium on Clancy avenue and though in ill health for the past two years continued with his work. He was born in Ithaca, N. Y. and graduated from the University of Cincinnati Medical school. He first practiced at Freeport, Mich., but later came to Grand Rapids and has been in practice nearly 40 years. He was a member of the American Medical Association, Kent County Medical Society, Michigan State Medical Society.

County Society News

HOUGHTON COUNTY

The Houghton County Medical Society held its regular monthly meeting at the Douglas House, Hough-

ton, Tuesday, Nov. 2, 1926. After reading of minutes and allowing of bills Dr. W. H. Dodge gave a very fine talk on Medical Ethics. This was discussed by all present.

Dr. Simon Tevin next read a paper on "Epigastric Hernia," this was fully discussed by those present.

Society then adjourned to lunch.

Respectfully,
G. C. STEWART, M. D.,
Secretary.

SHIAWASSEE COUNTY

The November meeting of the Shiawassee County Medical Society was held in Owosso at the city hall auditorium on Tuesday evening, Nov. 2.

Dr. R. Earle Smith, of Grand Rapids addressed the society on "The Treatment of Skin Diseases." The history varieties, etiology, differential diagnosis and treatment was well covered, and the whole was finely illustrated by colored slides. At the close a vote of thanks was tendered the doctor.

W. E. WARD,
Secretary-Treasurer.

BAY COUNTY

Wednesday evening, Oct. 20, the society gave a complimentary banquet commemorating the 50 years in the practice of medicine of Dr. John W. Hauxhurst. Eighty persons including the member's wives sat down to the banquet at the Wenona Hotel.

Dr. Hauxhurst gave an interesting account of his recent trip to New York, Panama, Havana and Alaska.

The society presented Dr. Hauxhurst with a silver water pitcher and Mrs. Hauxhurst with a floral tribute.

Dr. Hauxhurst, a graduate of the University of Michigan has practiced in Bay City continuously for the past 50 years.

GRACIOT-ISABELLA-CLARE COUNTY

The November meeting of the G.-I.-C. was held in the Height House, Alma, Thursday, Nov. 4. Twenty-three came to the supper. After all had done justice to the latter, Dr. Merrell Wells of Grand Rapids talked on "Pernicious Anemia and associated conditions." Everyone listened attentively to the doctors' able presentation of this subject, after which the doctor, very kindly answered many questions. On behalf of the society, President Graham thanked Dr. Wells for his instructive talk.

E. M. HIGHFIELD,
Secretary.

EATON COUNTY

The Eaton County Medical Society held its October meeting on Thursday, Oct. 28 in the offices of Dr. Don V. Hargrave, Eaton Rapids, Mich.

There were 10 members present and after a short business session we proceeded to the program of the evening.

Dr. Henry J. VandenBurg of Grand Rapids gave a very interesting talk on gall bladder diseases. He told of many practical points in the diagnosis of these diseases and by a round table discussion of the subject helped every one present to be a better understanding of these conditions.

Very truly yours,
H. J. PRALL,
Secretary.

GRAND TRAVERSE-LEELANAU CO.

The Grand Traverse-Leelanau County Medical Society held its November meeting Oct. 29, this date being arranged for the convenience of Dr. Reuben Peterson, of the University of Michigan, who was with us. Any time this grand (I won't say old) man comes from Ann Arbor, he can have any date, and all the dates, he wishes.

Dr. and Mrs. George F. Inch, of the State Hospital, were hosts of the society, serving a bountiful dinner at 6:30, after which Dr. Peterson, in his usual splendid manner, gave a real treat, dealing on Modern Obstetrics. Needless to say that Dr. Inch's entertainment and Dr. Peterson's paper were greatly appreciated by the 22 members who were present. It was late when we got home. Fact is, our meetings this year are so profitable, and our associations so congenial, that our getting together is a real pleasure, and we are never in a hurry to say "good night."

G. A. HOLLIDAY,
Secretary.

MACOMB COUNTY

The regular monthly meeting of the Macomb County Medical Society was held Nov. 1 at the Colonial Hotel, Mt. Clemens. There were 20 members present.

Luncheon was served at 12 o'clock—during this time the meeting was addressed by Dr. Poole of the State Department of Health on the subject of "Toxin Antitoxin." Dr. Poole traced the development of antitoxin and later toxin antitoxin from its early stages up to its perfected state. He also pointed out the effect the use of these remedies had on the morbidity and mortality rates in diphtheria.

Following luncheon a business meeting was held for a short time.

The minutes of the previous meeting were read and adopted. The application of Dr. Atkinson of New Baltimore for membership was referred to the membership committee for action.

The secretary was instructed to convey on behalf of the members of the society their sympathy and sincere wishes for a speedy recovery to Dr. G. O. Roberson of Utica in his recent illness.

The announcement was made of the next meeting to be held December 6th at which time the officers for the new year are to be elected.

Dr. John L. Cluster of Detroit then addressed the society—his topic being the "Common Diseases of the Heart."

The meeting closed with a rising vote of thanks to both speakers for their interesting and instructive papers.

Yours truly,
A. A. THOMPSON,
Secretary.

MUSKEGON COUNTY

The Muskegon County Medical Society met Oct. 15 with 21 members present. The advisability of availing ourselves of the service offered by the Physicians Rating Bureau of the Chamber of Commerce was dis-

cussed and an informal vote of those present showed 19 in favor and 2 undecided.

A request from our state secretary that a legislative committee be appointed resulted in the following committee being appointed by President Thornton:—Dr. George L. LaFevre, chairman; Dr. R. J. Harrington, Dr. F. N. Morford and Dr. Viggo Jensen.

A communication from Olin West, secretary of the A. M. A. in re: Disaster Relief was read and favorably acted upon. The formation of the unit was left to the president and secretary.

A letter from Dr. Warnshuis informing us that Dr. Stoddard had been made an honorary member of the State Society was read, as also was Dr. Stoddard's letter of appreciation. A remarkable letter from a gentleman of his age. Dr. Stoddard's letter is enclosed. A letter from the secretary of the Minnesota State Society inquiring as to the attitude of our members toward medical schools their attached hospitals and public health, welfare and other free medical service organizations was read and the secretary instructed to reply that we "Are agin it."

On Oct. 20 the medics held a joint meeting with the Muskegon Bar Association at the Occidental Hotel. Following the banquet Dr. Henderson, director of the University Extension Bureau, spoke on "Keeping Up to the Times." All enjoyed the talk of Mr. Henderson. The lawyers were represented by Mr. Francis Lovelace who spoke on some angles of medical jurisprudence. This the medics enjoyed.

P. S. WILSON,
Secretary.

ST. CLAIR COUNTY

Meeting called to order by President Moffett at 7:45 p. m. The Seventh District Dental Society were invited to be present as guests of the society and the following members responded to our invitation: Drs. Myron, Getty, Swartz, Stevens and Bean. The following members of the Medical Society were in attendance: Drs. Attridge, Vroman, Moffett, Clancy, Smith, Ryerson, Heavenrich, Cooper Kesl, Ard, Callery, Burley, Windham, Wheeler, MacPherson and MacKenzie.

The minutes of our meeting on Nov. 4, 1926, read and approved. Dr. Moffett appointed the following committee for Medical Relief in Disaster: Dr. Theo. Heavenrich, chairman, Dr. T. H. Cooper and Dr. A. L. Callery.

The invitation of Highland Park Physicians' club to attend their first annual clinic to be held on Dec. 2, 1926, at the General Hospital, Highland Park, was again read and 10 members pledged themselves to attend. A motion was made, seconded and carried moving ahead one day our next regular meeting in order to allow these members to attend the Highland Park Clinic.

President Moffett expressed pleasure in having some of the members of the Dental Society present and introduced the speaker of the evening, Mr. Frank R. Schell, a member of St. Clair County Bar Association and a practicing lawyer of Port Huron, who addressed the subject on the general subject of Medical Jurisprudence. Mr. Schells' talk was very profitable to those in attendance and at its conclusion a thorough discussion took place almost everyone present asking one or more questions upon the subject. A rising vote of thanks was given the speaker following which the meeting adjourned at 10:40 p. m.

Respectfully,
G. M. KESL,
Secretary-Treasurer.

KENT COUNTY

The Kent County Medical Society has had two meetings in October as the opening of the fall season. The first meeting was addressed by Dr. A. R. Hufford of the Mayo Clinic on the subject "The Relation of Focal Infection to Peptic Ulcer." He detailed and illustrated with lantern slides the work of Dr. Rosenow and himself on this subject and reported their belief in the relationship between focal infections of streptococcus viridans and peptic ulcer.

The second meeting was addressed by Dr. C. F. Karshner of Grand Rapids on the subject "Rheumatic Heart Disease." This was one of the most comprehensive papers we have heard. He covered the subject so thoroughly, and well that discussion is superfluous.

The Kent County Medical Society has directed its members to sever their connection with the local clinic for infant feeding. One year ago a clinic investigating committee was appointed for the purpose of investigating the free clinic situation in Grand Rapids particularly. This committe has collected a great mass of data not only about the local clinics but also about clinics over the United States, which they aim to use in further investigation during the coming year. One of their first recommendations was the severance of the connections with the Clinic for Infant Feeding because of their refusal to co-operate with the Kent County Medical Society and because of their persistent purpose to admit patients to the clinic who were able to pay their physician.

The free clinic situation is real and it is obligating for every physician interested in the future of medicine to take an active part in curbing the abuse of clinics. Interest in restricting the activities of clinics has become nation wide. Our own committee is very active in this matter and purposes to make many changes in the future for advantage to the medical profession and also the public.

H. T. CLAY,
Secretary.

KALAMAZOO COUNTY

The regular monthly meeting of the Kalamazoo Academy of Medicine was held in the rooms of the Academy Tuesday, Oct. 19, 1926 at 8 p. m.

The meeting was called to order by the President. Dr. McNair. Due to the fact that Dr. Peet desired to catch an early train the business meeting was postponed until after the scientific program.

Dr. William Huyser gave a very instructive and interesting article on Brain Injuries. The basis for the article was a series of cases cared for in the local hospitals by local men.

Dr. Max M. Peet then discussed the subject of Brain Injuries. Dr. Peet covered the subject very thoroughly and his talk was enjoyed by everyone.

The secretaries report was read as printed in the Bulletin and approved.

There were no committee reports.

Communications were read from the Commonwealth Fund and from the Michigan State Medical Society.

The Staff of the United States Veterans Hospital No. 19, Camp Custer extended an invitation to the society to be their guests for a dinner and meeting at the hospital at a future meeting.

Motion was made by Dr. Huyser seconded by the society that the invitation be accepted with thanks. Carried. The Program Committee was instructed to make the necessary arrangements. Motion was made by Dr. Jackson seconded and carried that the president

appoint a Legislative Committee to co-operate with the State Society.

Dr. Jackson spoke in favor of a local organization for medical relief in case of disaster as planned by the American Medical Association. A motion was made and carried that a committee be appointed by the chair to take charge of such an organization.

Dr. Ray T. Fuller was voted into active membership of the society. Dr. C. J. Swan as associate member. The names of Dr. V. H. Wells of Lawton and Dr. Hugo Aach were proposed for membership.

Adjournment.

GENESEE COUNTY

The following is a list of the Genesee County Medical Society meetings not reported to the Michigan State Medical Society.

Genesee County Medical Society met for noon luncheon, Hotel Dresden, May 12, 1926.

Speaker,Dr. Burr, Honorary Member of G. C. M. S. and M. S. M. S.

Subject—"The Advantages of Being Old."

Genesee County Medical Society met for noon luncheon, Hotel Dresden, May 26, 1926.

Speaker, Dr. C. Badgley, Professor of Orthopedic Surgery, University of Michigan Medical Department.

Subject—"The Treatment of Ununited Fractures."

Genesee County Medical Society met for noon luncheon, Hotel Dresden, Sept. 8, 1926. This was an exchange meeting with the Alpena County Medical Society.

Speaker, Dr. O'Donnell, Alpena, Michigan.

Subject—"Diagnosis and Treatment of Kidney Injuries."

Speaker, Dr. Newton, Alpena, Mich.

Subject—"Relation of Eye Infections of Focal Infections."

Genesee County Medical Society met for noon luncheon, Hotel Dresden, Sept. 22, 26.

Speaker, Dr. Bernbaum, Herman Kiefer Hospital, Detroit, Mich.

Subject—"Diphtheria."

Genesee County Medical Society met for noon luncheon, Hotel Dresden, Oct. 6, 1926.

Speaker, Dr. G. Kiefer Hospital, Detroit, Mich.

Subject—"Scarlet Fever."

Geneese County Medical Society met for noon luncheon, Hotel Dresden, Oct. 20, 1926.

Speaker, Dr. C. D. Camp, Department of Neurology, University of Michigan Medical Department.

Subject—"Neurosyphilis."

Genesee County Medical Society met for noon luncheon, Hotel Dresden, Nov. 3, 1926.

Speaker, Dr. M. Peet, Professor of brain and nerve surgery, University of Michigan Medical Department.

Subject—"Treatment of Skull Fractures with Associated Brain Injury."

G. J. CURRY,
Secretary.

ST. JOSEPH'S, BRANCH AND HILLSDALE COUNTY

The Joint Meeting of the Medical Societies of the counties of St. Joseph's, Branch and Hillsdale was held on Wednesday evening, Oct. 20 at the Knights of Pythias Hall at 6:30 p. m., the president, Dr. J. H. Johnson in the chair.

After a bountiful dinner served by the ladies of the K. of P., Dr. Sawyer, at the request of the president introduced the speaker of the evening, Dr. Max Peet of the University of Michigan.

Dr. Peet addressed the members present on—"The Treatment of Pain by Neurological Method." His address was of the greatest interest, leading into a realm which has heretofore been the despair alike of physician and patient.

He spoke, in part, of the successful treatment of tic douloureux by driving the sursory root leading to the gasserian ganglion, instead of removing the whole ganglion; a most formidable operation of the treatment of the branches of that ganglion by alcoholic injection before proceeding to the more radical operation of section and of the removal of part of the abdominal chain of the sympathetic systems for the relief of various forms of spastic paralysis of the lower extremities and even of some forms of gangrene of the feet.

Dr. Peet did not claim success for all these critical and extremely special operations, but when we reflect that they deal with some of the most frightful and hopeless conditions that torture suffering humanity, it is certainly inspiring to know that we can, through such men as Dr. Peet, hold out more than a ray of hope, even a good prospect of relief. Owing to the extremely advanced and technical nature of the address, it was not followed by extensive discussion, but Dr. Peet answered a number of questions in explanation of certain points brought out in the address. All the members present feel that they owe a debt of gratitude to Dr. Peet for his splendid address.

As there was no routine business, the names of Drs. Hamilton and Poppen of Reading were proposed for membership in the Hillsdale County Society and were unanimously accepted.

Adjourned.

D. W. FENTON,
Secretary.

CALHOUN COUNTY

The eighth regular meeting of the Calhoun County Medical Society was called to order in the convention room of the Parker Inn, Albion, at 8 p. m. following dinner.

The minutes of the previous meeting were approved and printed in the Bulletin.

The secretary read a communication from the State Society relative to the appointment of five members to act as a legislative committee. It was moved by Dr. Winslow that the president appoint two members to supplement the already existing committee of three. Carried. Dr. Winslow, Dr. Hafford, Sr., were appointed.

A second communication from the State Society was read by the secretary relative to perfecting a local organization to act in case of disaster. The plan for adopting medical relief in disaster was carried at a meeting of the House of Delegates recently held in Lansing. It was moved by Dr. Eggleston the chairman appoint a committee of three to work with the secretary and president in perfecting a local organization. Seconded and carried. Dr. Kingsley. Dr. Church and Dr. Thompson appointed.

Motion was made by Dr. Gorsline the secretary communicate with the chairman of the committee on Periodical Physical examinations and secure action. Carried.

Dr. Martin gave a report as chairman of the Publicity Committee. It was suggested that all members

desirous of making talks on Public Health matters before various local and county organizations, communicate with Dr. Martin.

Dr. Gorsline suggested the society place before each child of school age a copy of Hygeia. It was moved a committee be appointed to look into this matter, form estimates, and report at the next meeting. Carried. A further motion was made by Dr. Hafford, Sr., that the secretary incorporate this report in the next Bulletin. Carried. Dr. Gorsline appointed by the chairman to act as the committee.

The speaker, Dr. A. E. Halstead of Chicago was introduced by the president. His subject was "Bronchial Fistula" illustrated by slides.

Attendance at dinner and meeting 51.

The ninth regular meeting of the Calhoun County Medical Society was called to order in the Post Tavern dining room at 7:30 p. m. following dinner.

The minutes of the previous meeting were approved as printed in the Bulletin.

On behalf of the society, Dr. Haughey, Sr., presented Dr. Godfrey with a silver loving cup in recognition of his 50th anniversary as a practicing physician in Battle Creek.

Dr. Gorsline gave a report on the progress made in connection with the society's endeavor to place "Hlgeia" before each schoolroom in Calhoun County. On account of the large number of rural schools, it was suggested that some of these copies could be remailed. The total cost to the society in this way would come at approximately $325. Discussion by Drs. Kingsley, Church, Allen, Gallagher and Olsen. It was moved and supported that Dr. Gorsline, in conference with the president and secretary, proceed in this matter using his best judgment. Motion carried.

Dr. Holton reported for the committee on Periodical Physical Examinations. The president asked each member of the society to try and have a complete physical examination.

Dr. W. H. Haughey gave a rather lengthy report as chairman of the committee, relative to securing better co-operation with the superintendent of the poor in the matter of care of the poor and medical fees. His recommendation is the following: "That your committee be instructed to co-operate with other people or societies interested, try to get the prosecuting attorney to work up the case and legally present it with all the evidence obtainable at the January session of the board of supervisors and also continue our efforts to secure better treatment of our poor and better understanding between the board of supervisors and our members in Battle Creek and vicinity."

The following resolution was read by Dr. Rosenfeld: "We, the members of the Calhoun County Medical Society wish to make strong protest against the statement made by Fred Rector, county superintendent of poor for Battle Creek, before the county board of supervisors and citizens at the courthouse in Marshall on Monday, Oct. 5, to the effect that no doctor will take care of a poor patient unless payment of his bill is guaranteed in advance by the county.

"We consider this as maligning the profession as a whole and believe that said Mr. Rector should and must make a written retraction of this statement to this society before our next regular meeting." Discussion Drs. Winslow, Russell, Gallagher, VanCamp and Haughey. Dr. Gorsline made an amendment that the resolution be placed in the hands of our committee to be used as they see necessary. Vote on resolution as amended—carried.

President introduced the speaker, Dr. Kellogg Speed of Chicago who gave an exceedingly interesting, practical talk, illustrated with lantern slides on the subject of "Fractures."

L. E. VERITY,
Secretary.

ST. CLAIR COUNTY

I herewith submit report of several recent meetings of this society.

A regular meeting of St. Clair County Medical Society was held at the Hotel Harrington, Port Huron, Mich. on Oct. 7, 1926. Meeting called to order at 7:30 p. m. Dr. J. A. Attridge presiding in the absence of all officers. Members present, Drs. Attridge, Windham, Patterson, H. O. Brush, Callery, Heavenrich, O'Sullivan, McColl, Clancy, Cooper, Treadgold, Wheeler and Ryerson.

Dr. Ryerson assumed the chair upon his arrival and Dr. D. J. McColl acted as secretary.

Dr. Gertrude O'Sullivan health officer of the city of Port Huron, discussed the advisability of general immunization with toxin-antitoxin among the children of the city. She was instructed by the society to prepare suggestions in reference to the matter and to submit them at the next meeting of the society.

Dr. D. W. Patterson read a paper on, "Blood chemistry in kidney conditions" and Dr. H. O. Brush read a paper on, "Kidney Function." Both papers were well received and thoroughly discussed by the members present.

Meeting adjourned at 9 p. m.

A regular meeting of St. Clair County Medical Society was held at the Hotel Harrington, Port Huron, Michigan on Oct. 21, 1926. Meeting called to order at 7:50 p. m. by President Moffett with the following members in attendance: Drs. Cooper, Windham, Heavenrich, Patterson, Callery, Waters, Wheeler, Burley, Kesl, O'Sullivan and Bowden. Minutes of meetings of May 27 and Oct. 7, 1926 read and approved. An invitation from the Highland Park Physicians' club to attend the first annual clinic of that organization to be held at the Highland Park General Hospital on Dec. 2, 1926, was read and acted upon favorably. Most of those present agreeing to attend the clinic. A motion was made, supported and adopted authorizing the president to appoint a committee to perfect plans for medical relief of disaster. A discussion of appropriate newspaper publicity upon the subject of medical relief in disaster followed and President Moffett stated that he would obtain same if possible.

Dr. Moffett addressed the society upon the aims and purposes of the Committee on Public Health of the society. The minutes of this committee's meeting of Oct. 19, 1926 were read and approved by the society. A motion was made, seconded and adopted commending the work of this committee, particularly in addressing a letter to the Board of County Supervisors relative to the appropriation of funds with which to test all diary herds in St. Clair County for tuberculosis.

Dr. Heavenrich extended an invitation to the members of the society to meet with the Rotary club of Port Huron on Thursday, Oct. 28, 1926, to hear an address by Dr. R. M. Olin.

A discussion of goitre followed. Dr. Gertrude O'Sullivan, city health officer of Port Huron stated she believed the treatment of certain school children with iodine should be undertaken. The members of the society discussed the iodine content of the ordinary iodine table salt and whether sufficient iodine was contained therein to give individuals requiring iodine a

sufficient amount of this chemical. The secretary was instructed to write Dr. R. M. Olin relative to the matter of goitre and the prophylactic treatment of same by iodine.

The secretary was instructed to address a letter to the Secretary-Editor of the Michigan State Medical Society relative to what other county societies were doing upon the subject of organizing units for medical relief in disaster.

Dr. Gertrude O'Sullivan passed a copy of the proposed milk ordinance among the members present and also a copy of the latest milk analysis report. Dr. Sullivan also made a report covering the incidence of communicable diseases in the city of Port Huron for the month of September, 1926.

Dr. Moffett suggested the health officer prepare a summary of the work of examining the school children at the time the city schools opened early in September. This work was done by the members of the St. Clair County Medical Society without compensation at the request of Dr. O'Sullivan.

A general discussion of scarlet fever followed. The question of shortening the period of quarantine for this disease was debated. The question whether this disease was communicated from person to person during the stage of desquamation was brought up and several interesting cases were cited by Dr. George Waters in which the doctor contended infection during this stage had occurred. Dr. Heavenrich and Dr. Callery also discussed the advisability of shortening the period of quarantine in scarlet fever, inasmuch as a long quarantine oftimes worked a hardship upon certain families. Meeting adjourned at 9:30 p. m.

A regular meeting of St. Clair County Medical Society was held at the Hotel Harrington, Port Huron, Mich. on Nov. 4, 1926. Following a supper and social hour the meeting was called to order at 7:30 p. m. by President Moffett with the following members present: Drs. Clancy, Patterson, Ryerson, Lewis, Morris, Smith, Vroman, Burley, Attridge, Callery, McColl, Bowden, Kesl, Waters, Windham and Wheeler. The regular order of business was suspended and the president introduced the guests of the evening, Dr. R. S. Siddal and Dr. R. H. Durham, both members of the staff of the Henry Ford Hospital of Detroit.

Dr. Siddal addressed the society upon the subject, "Certain aspects of obstetrics." Owing to the fact that the secretary is not familiar with the intricacies of shorthand it is not possible to report fully upon these splendid papers. Just a few high points in each may be mentioned. Dr. Siddal stated that in his experience if occiput posterior presentations were handled conservatively the end result was favorable and the condition was not to be dreaded. He stated that at the Ford Hospital it was customary to use dilute tincture of iodine of a 1 per cent solution of mercurochrome to disinfect the vulva in confinement. That perineal aftercare should be only that required by personal cleanliness. In regard to diet in the toxemias of pregnancy the speaker stated that in his experience it was harmful to withhold protein food entirely. Speaking of ecclampsia he stated that this condition was not wholly a kidney affair but that other factors entered into its occurence. In general the speaker seemed to feel that attention to detail is worth while in obstetrics. The discussion of the paper of Dr. Siddal was opened by Dr. D. J. McColl, followed by several others and closed in the usual manner by Dr. Siddal.

Dr. R. H. Durham addressed the society upon the subject, "Treatment of Acute Lobar Pneumonia." It is very difficult in such a brief report as this to do justice to the excellent talk of this speaker. Dr. Durham said that the history of the treatment of this condition throughout the past ages is a very interesting subject because of the many discarded methods of treatment. Up to the year of 1910 the treatment was largely symptomatic. In that year the discovery was made that horse serum prepared from type one of the pneumococcus was effectual in the treatment of pneumonia due to type one pneumococcus. One of the earliest observations in the treatment of this condition was that the patient who was left alone did as well as one who was treated in a brisk manner. Prophylaxis of pneumonia has made great advances in the past decade. The avoidance of overcrowding in poorly ventilated places and the close contact with those suffering with conditions of the upper respiratory tract has done much to prevent pneumonia.

Polyvalent vaccines, used in South Africa, have reduced the mortality of pneumonia in that continent. This is especially true of type one infections, the incidents of which showed a great decline. Vaccine therapy in the United States for the prevention of pneumonia have not been entirely successful.

The use of type one serum in the treatment of type one pneumonia is a rational proceedure. After testing the patient for sensitivity to horse serum by the injection of one c.c. of the serum, 50 c.c. is given intravenously, this is followed in several hours by 200 c.c. and this in turn by injections of 100 c.c. at intervals of four hours. The use of antibody solutions is effectual in treatment of pneumonia but is, unfortunately, followed by sharp reactions.

Regarding the use of drugs in pneumonia, Quinine, recently has come into vogue. This drug has a bactericidal effect upon the specific organisms as well as a neutralizing effect upon their toxins. Neumoquin base has come into widespread use in the United States and apparently is useful.

The symptomatic treatment of pneumonia in the absence of any known specific drug must be relied upon to combat the disease. Nursing is an important factor. All possible rest is to be secured for the patient. Fresh air and a liquid nourishing diet are indicated. Elimination must be secured but not drastic catharsis. Hydrotherapy must be relied upon to lower excessive fever and to keep skin free. Baths at a temperature of 68 to 70 degrees F. may be given a short intervals while the temperature remains over 102.5 degrees F. Oxygen continues in use at the hospitals as a potent aid in anoxemia. All of the larger clinics believe this agent is efficacious. Inasmuch as circulatory failure is the great cause of mortality in this disease, the heart must be supported as soon as any sign of heart failure is observed. In empyema prompt drainage, either medical or surgical is indicated. In the minds of the speaker the former offers as much as the latter. Aspiration of pus followed by injection of a solution of gentian violet at repeated intervals offers as much relief as surgical drainage.

The discussion was opened by Dr. A. L. Callery, followed by Dr. C. C. Clancy and others. Dr. Durham closed his talk in the usual manner.

Dr. J. J. Moffett, president, thanked the guests for their excellent talks and Dr. C. C. Clancy added a word of appreciation and moved a rising vote of thanks to be extended them by the society which was unanimously adopted. The meeting adjourned at 10 p. m.

Respectfully,

GEORGE H. KESL,

Secretary-Treasurer.

Among the Books

A Review and Frank Appraisal of Medical Books That are Proffered to the Profession by Publishers.

HOW WE BECOME PERSONALITIES—E. H. Williams, M. D. Bobbs-Merrill Co., Indianapolis.

This purports to be a non-technical discussion of endoctrinology for lay education. The author in his introduction expresses the following sentiment: "the three most important subjects before the public are aviation, the radio and glands." That sentiment or author's view seemingly governed him in the preparation of the contents. In our opinion he has bowed to woe popularity and sacrificed if not really harmed scientific understanding by the lay man of this subject of the endoctrines. There are, however some facts well put but these are negative by discussing incidents, assumptions and theories not yet established and implying that they are facts by inserting clinical illustrations of isolated cases to substantiate his nebulous assumptions. It is regretable that such a book is made available. Had the author simply imparted known facts, quit and concluded with the statement that this is all we now know, a book worth while would have resulted. The price is $3.

GENERAL INDEX VOLUME OF THE COLLECTED PAPERS OF THE MAYO CLINIC AND THE MAYO FOUNDATION—1884 to 1925 inclusive. Octavo volume of 227 pages. 1926. Cloth, $5 net. W. B. Saunders Company, Philadelphia and London.

THE SURGICAL CLINICS OF NORTH AMERICA—(Issued serially, one number every other month.) Volume VI, Number IV (Mayo Clinic Number—October, 1926.) 274 pages with 91 illustrations. Per clinic year (February 1926 to December, 1926.) Paper, $12; Cloth, $16 net. W. B. Saunders Company, Philadelphia and London.

HUMAN PATHOLOGY—Howard T. Karsner, M. D., Western Reserve University. Cloth, 979 pp. illustrated. J. B. Lippincott Co., Philadelphia. Price $10.

The history of pathology shows a gradual evolution from a subject based almost entirely on morphology to one so comprehensive that as H. R. Dean says, "to the pathologist—all medical things are pathology." From this point of view clinical medicine is applied pathology. At any rate, pathology is no longer merely the study of morbid form, although no evolution or development can divorce from it the fundamental importance of pathological anatomy. The purpose of this book is to present the morphological alterations incident to disease, in the light of modern views as to their functional significance. The subject matter is confined to human pathology, since the work is designed for students and practitioners of medicine, but general biology has been called upon to furnish data relevant to the origin, course and natural history of disease as it affects man. The features of morbid anatomy and histology are studied objectively and are looked upon as established facts. At the present time, explanations and interpretations of its phenomena are often hypothetical and the attempt is made in the discussions to distinguish clearly between fact and theory. A working knowledge of normal anatomy and physiology and of bacteriology is prerequisite to a comprehension of pathology. These subjects are correlated with the processes and products of disease and, with the more important topics, the whole concept is employed as a basis for a brief introduction to the clinic. In summary this is a textbook of pathological anatomy and histology, related to the broader functional aspects of disease.

A textbook is only an introduction to the essentials of a subject. References may be given to the literature, but, in view of the rapid advances of biological and medical research, only by observation, investigation and well directed reading can the subject matter be kept abreast of the times. An important part of education is acquaintance with the names of those who have furnished its heritage. In the earlier chapters the names of investigators are given in the text infrequently and the student can get the references from the list at the end of each chapter. Later, however, as greater familiarity with the subject is assumed, the names are inserted more freely. In so far as possible references are made to journals easily accessible and in the English language. The bibliography is in no sense complete, but is so selected that by its use an introduction to the literature of pathology may be gained. The mode of reference is in accord with that of the American Medical Association.

The conventional division into general and special pathology has been adopted as the result of a long teaching experience. It is believed that this arrangement is in harmony with the position of pathology in the medical curriculum and best serves to present the subject as an introduction to, and a basis for, the clinical branches. For the advanced student and the practitioner it affords convenience of reference.

At the beginning of each chapter in general pathology the factual material is arranged in tabular form so as to give each topic its relative associations in the entire subject. This is regarded as of distinct pedagogic importance and in our experience has established its value. It may also serve as the basis of the problem method in the teaching of pathology, but before problems can be set it seems essential to provide a background of major and minor premises in the mind of the student.

Many of the illustrations were made under the direction of Dr. Simon Flexner for a book on pathology which he proposed to write. Manifold duties prevented him for completing a manuscript and the illustrations have been turned over to the author, who cordially acknowledges his gratitude. Thanks are due the Surgeon General of the Army and Major James F. Coupal for the us of photographs made at the Army Medical Museum, Washington, D. C. Other illustrations have been made from a rich material provided by association with several hospitals in this and other cities. The entire list of illustrations has been carefully selected and limited. Their purpose is to clarify the text rather than to provide a pictorial atlas.

PRINCIPLES AND PRACTICE OF CHEMOTHERAPY —With special reference to the specific and general Treatment of Syphilis. By John A. Kolmer, M. D., Dr. P. H., professor of pathology and bacteriology in the Graduate School of Medicine, University of Pennsylvania. 1,106 pages with 82 illustrations. 1926. Cloth $12 net. W. B. Saunders Company, Philadelphia and London.

Here we are confronted with a new contribution to syphilology by an author who has long commanded our respect by reason of his professional attainments and his text on immunity and infection and specific therapy. The task of preparing this text has not been a light one, the result recompenses the effort for it has accomplished the completion of an authoritative book. We are deeply impressed with its completeness, its detailed pertinent discussions of essential factors, its diagnostic proceedures and the comprehensive advice as to treatment which stresses thoroughness. A text meriting acquisition by every doctor.